

July 22, 2011

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: *PJM Interconnection, L.L.C.*, Docket No. ER11-4106-000
Order No. 745 Compliance Filing

Dear Ms. Bose,

PJM Interconnection, L.L.C. (“PJM”), in compliance with the Commission’s Order No. 745,¹ hereby submits revisions to the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. (“Operating Agreement”) and PJM’s Open Access Transmission Tariff (“Tariff”) required by Order No. 745. As discussed below, to ensure a smooth implementation (including market participant training) for this important market design change, PJM proposes that the enclosed Operating Agreement and Tariff changes take effect on the first day of a calendar month that is at least 90 days after the Commission issues its order on this compliance filing.

I. BACKGROUND

A. Order No. 745

On March 18, 2010, the Commission issued a Notice of Proposed Rulemaking² seeking public comment regarding a proposal to compensate demand response resources participating in organized wholesale energy markets at the applicable locational marginal price (“LMP”). The Commission also sought comments on: (i) the comparability of generation and demand response resources; (ii) alternative approaches to compensating demand response resources in organized energy markets; (iii) whether LMP

¹ *Demand Response Compensation in Organized Wholesale Energy Markets*, Order No. 745, III FERC Stats. & Regs., Regs. Preambles ¶ 31,322 (2011) (“Order No. 745”).

² *Demand Response Compensation in Organized Wholesale Energy Markets*, Notice of Proposed Rulemaking, 130 FERC ¶ 61,213 (2010).

compensation should apply in all hours; (iv) if not, what criteria should be used to determine when LMP compensation should apply; and (v) whether to allow regional variations in the approach to demand response compensation.

On August 2, 2010, the Commission issued a Supplemental Notice of Proposed Rulemaking and Notice of Technical Conference seeking additional comment on: (i) whether the Commission should adopt a net benefits test for determining when to compensate demand response providers; (ii) if so, what requirements should apply to the methods for determining net benefits; and (iii) how the costs associated with demand response are allocated.³

On March 15, 2011, the Commission issued Order No. 745 to establish LMP as the compensation for demand response resources at times when dispatch of that demand response resource is cost-effective as determined by the net benefits test.⁴ Order No. 745 mandates that regional transmission organizations (“RTOs”) and independent system operators (“ISOs”) submit a compliance filing to implement the Commission’s LMP compensation approach using the net benefits test to establish a monthly threshold price, based on historical data, beyond which the overall benefits from the reduced LMP resulting from dispatch of demand response resources exceeds the cost of dispatching and paying LMP to those resources.⁵ Order No. 745 also required RTOs and ISOs to explain how their respective measurement and verification protocols ensure that appropriate load baselines are set and that demand response will be adequately measured and verified to ensure performance by each demand response resource.⁶ In addition, each RTO and ISO is required to demonstrate in its compliance filing whether its current demand response cost allocation methodology appropriately allocates costs to those that benefit from demand reduction, and if not, then to propose tariff revisions that implement such a methodology.⁷

B. PJM Stakeholder Process

PJM worked extensively with its stakeholders in an effort to seek a consensus on PJM’s Order No. 745 compliance filing, beginning shortly after the order was issued and ending only days before this filing is being submitted. Working primarily through the Market Implementation Committee (“MIC”), PJM and the stakeholders developed a matrix that identified the components of a compliance filing and offered alternative

³ *Demand Response Compensation in Organized Wholesale Energy Markets*, Supplemental Notice of Proposed Rulemaking and Notice of Technical Conference, 132 FERC ¶ 61,094 (2010).

⁴ Order No. 745 at P 2.

⁵ *Id.* at PP 4-6.

⁶ *Id.* at PP 6, 94.

⁷ *Id.* at PP 6, 102.

possible approaches on those components.⁸ PJM then selected an alternative for each of the components and combined those into a “PJM Proposal.” The PJM Proposal included any approach on which there was a clear stakeholder consensus. For components on which there was not a clear consensus, PJM selected the approach that appeared to have the greatest stakeholder support and that complied with Order No. 745.

Two groups of stakeholders also coalesced around two comprehensive alternatives to the PJM Proposal, known as the Curtailment Service Providers Proposal, and the Diversified Companies Proposal. Notably, the other two proposals agreed with the PJM Proposal on the proper approach to many of the components, but they disagreed with the PJM Proposal, and with each other, on other components.⁹

Among other points of agreement, all three proposals agree on the following elements that are included in this filing: (i) the method of calculating the Net Benefits Test threshold price; (ii) payments to load reductions that satisfy the Order No. 745 criteria and that follow PJM’s dispatch instructions will be at the higher of LMP or the total value of the offer (including, e.g., shut-down costs and the impact of minimum down time); (iii) actual load reductions that significantly deviate from the scheduled reductions should be assessed balancing Operating Reserve deviation charges; (iv) LMP-based payments for load reductions should be allocated to Real-time load plus export share; and (v) demand response participants should have the capability to receive and acknowledge electronic dispatch instructions.

The MIC took an indicative vote on the three proposals at its July 12, 2011 meeting. Two-thirds of those present voted to advance the PJM Proposal to the Markets and Reliability Committee. The Markets and Reliability Committee then voted on the three proposals at its July 20, 2011 meeting. The PJM Proposal was favored by a large majority of the stakeholders, but not by the super-majority specified in the governing agreement for formal endorsement. Specifically, the PJM Proposal received a sector-weighted vote of just under 60% in favor. The Curtailment Service Providers Proposal received a sector-weighted vote of approximately 37% in favor; and the Diversified Companies Proposal received a sector-weighted vote of approximately 32% in favor.

⁸ The Market Implementation Committee (“MIC”) addressed compliance with Order No. 745 at meetings held on April 12, 2011, May 10, 2011, June 8, 2011, June 27, 2011, and July 12, 2011.

⁹ The final form of the Order No. 745 compliance options matrix is posted among the materials for the July 20, 2011 Markets and Reliability Committee meeting at: <http://www.pjm.com/committees-and-groups/committees/mrc.aspx#20>.

II. DESCRIPTION OF MARKET RULE REVISIONS TO COMPLY WITH ORDER NO. 745

A. Eligibility For Compensation Under Order No. 745.

1. Order No. 745 Requirements.

In Order No. 745, the Commission established that demand response is eligible for LMP-based compensation “only when two conditions are met,”¹⁰ i.e., (1) the demand response resource has “the capability to balance supply and demand as an alternative to a generation resource;” and (2) “dispatch of that resource is cost-effective as determined by the net benefits test.”¹¹ The Commission explained that when “the net benefits test described [in Order No. 745] is satisfied;” and the demand response resource “clears in the RTO’s or ISO’s economic dispatch” then “the demand response resource is a cost-effective alternative to generation resources for balancing supply and demand.”¹² The Commission adds that demand response resources that are dispatched to balance supply and demand provide a “service” to the energy markets and “must be compensated for the service . . . at the market price for energy,” i.e., at LMP.¹³

Even beyond these statements, economic dispatch is integral to the compensation scheme established by Order No. 745. Under Order No. 745, demand response is compensated when dispatching demand response is cost-effective, i.e., when “the overall benefit of the reduced LMP that results from dispatching demand response resources exceeds the cost of dispatching and paying LMP to those resources.”¹⁴ Thus, to be compensable under Order No. 745, demand response must be offered into the market, the offer price must be economic compared to other resources available at or above that threshold price, and PJM must select, i.e., dispatch the load reduction resource in its economic dispatch.

The benefits of demand response and the fundamental basis for the net benefits test support and recognize the value to the dispatcher of being aware of and able to call upon demand response to meet load conditions concurrent with his consideration of generation resources. The Order No. 745 requirements will enhance reliable grid operation, promote economic efficiency, and increase economic benefits by providing incentives for demand response resources to supply the RTO with more (and timely) load reduction information for incorporation directly into the RTO’s dispatch. By contrast, current rules, such as those in PJM, do not incent load response providers to supply

¹⁰ Order No. 745 at P 48.

¹¹ *Id.* at P 2.

¹² *Id.* at P 3

¹³ *Id.* at P 2.

¹⁴ *Id.* at P 3.

advance information, thereby preventing the RTO from fully realizing the economic and operational advantages those resources can bring to the region.

2. Compliance Revisions to the PJM Market Rules.

a. Requirement that Load Reductions Balance Supply and Demand as an Alternative to Generation.

To implement the requirements of Order No. 745 that compensable demand response must be capable of being dispatched to balance supply and demand and must satisfy the net benefits test, PJM is modifying certain sections of its market rules pertaining to Economic Load Response.¹⁵ Specifically, PJM modifies market rule section 3.3A.1 to provide that only “demand reduction offers submitted in the Day-Ahead Energy Market or Real-time Energy Market that satisfy the Net Benefits Test of section 3.3A.4; that are scheduled by the Office of the Interconnection; and that follow the dispatch signals of the Office of the Interconnection” will be compensated.¹⁶ PJM also is amending sections 1.5A.7, 3.3A.1, 3.3A.5(a), 3.3A.6(a), and 3.3A.7(a) to state that each offer for demand reduction must satisfy the Net Benefits Test of section 3.3A.4 and be dispatchable to be eligible for compensation. Similarly, PJM is modifying section 1.5A.9 to provide that participants “shall be compensated under section 3.3A.5 and 3.3A.6 only if they participate in the Day-ahead or Real-time Energy Markets as a dispatchable resource.”¹⁷

b. Receipt of Electronic Dispatch Signal.

To ensure effective dispatch communications, PJM is adding a new subsection (b) to section 1.5A.4 to require that curtailment service providers (“CSPs”) be responsible for maintaining, or ensuring that participants maintain, the “capability to receive and act upon an electronic dispatch signal.”¹⁸ PJM agreed with the large majority of stakeholders that load reduction capability need not be directly telemetered by PJM as a condition of qualifying for the compensation contemplated by Order No. 745. Establishing the capability to receive and respond to an electronic dispatch signal will significantly improve communications between PJM dispatchers and demand response providers with far less upfront investment than telemetering would require.

¹⁵ PJM’s market rules appear in identical form in both Schedule 1 to the Operating Agreement and the Appendix to Attachment K to the Tariff. For convenience, PJM will cite only the Operating Agreement Schedule 1 sections. In each case, however, PJM is making the same changes to the identically numbered sections of the Appendix to Attachment K.

¹⁶ Operating Agreement, Schedule 1 proposed § 3.3A.1.

¹⁷ *Id.*, proposed § 1.5A.9.

¹⁸ *Id.*, proposed § 1.5A.4(b).

c. Participation in Day-Ahead Energy Market.

In accordance with Order No. 745, demand response reductions that are dispatched by PJM (and satisfy the Net Benefits Test) qualify for compensation at full LMP. PJM is submitting conforming changes to ensure that the dispatch of Economic Load Response matches the fundamental system benefits that the net benefits test is designed to measure. PJM's existing market rules for load response participation in the day-ahead market generally are adequate to this task, ensuring sufficient and timely information flows from the market participant to allow PJM to schedule the system reliably and efficiently.

For demand reduction bids into the Day-ahead Energy Market, PJM proposes to continue to apply the same rule applicable to all resources, i.e., the submission of offers by noon on the day before each Operating Day. As today, offers must include the price, MW quantity, and hourly availability, and may include an offer curve with up to 10 price/quantity pairs. In addition, as today, all offers must specify any requirement for start-up costs associated with reducing demand, plus direct labor and equipment costs, opportunity costs,¹⁹ and any minimum number of contiguous hours for which the demand reduction must be committed. PJM will accept demand reduction offers on their merits in accordance with the net benefits test, as discussed in detail in the following section of this letter. As today, day-ahead commitments are settled at the day-ahead price.

d. Participation in Real-time Energy Market.

Economic Load Response mostly participates in PJM's real-time market today on a "self-scheduled" basis.²⁰ Under the self-scheduling rules, participants that choose to reduce load in real time are not required to submit an offer in the real-time market; instead, they can "simply reduce load and provide PJM with data showing that they have reduced load within 60 days."²¹ Participants self-scheduling demand reductions can wait until a mere 5 minutes before the operating hour to notify PJM of such reductions.²²

¹⁹ See Operating Agreement, Schedule 1 § 3.3A.5(b).

²⁰ See "Load Response Activity Report January-December 2010 Updated" at <http://www.pjm.com/markets-and-operations/demand-response/~media/markets-ops/dsr/2010-dsr-activity-report-updated-20110411.ashx>. In 2010 18.3 percent of reductions were scheduled day-ahead, while 90 percent of the settled real-time activity was self-scheduled.

²¹ *PJM Interconnection, L.L.C.*, 99 FERC ¶ 61,227, at 61,936 (2002); see also Operating Agreement, Schedule 1 §§ 1.5A.4 (60 days to provide PJM with load reduction data) and 1.5A.9 (describing requirements to self-schedule load reductions).

²² Operating Agreement, Schedule 1 § 1.5A.9(a)(i).

PJM's market rules expressly provide that self-scheduled demand reductions are not dispatched by PJM;²³ and expressly state that PJM does not consider self-scheduled resources in determining LMP.²⁴ Thus, PJM does not evaluate the economic merit of self-scheduled resources and determine whether to accept or decline the offers. The reductions are self-implemented by the market participant in the quantities and at the times of its own choosing, and PJM must schedule and dispatch around those reductions, i.e., alter the dispatch of other resources to take account of those self-scheduled reductions in real-time.

This current mode of real-time market participation must be revised substantially to meet the conditions established by Order No. 745. PJM's current market rules specific to self-scheduled demand reductions meet none of Order No. 745 criteria described above. Self-scheduled reductions do not submit an offer price; their reductions are not evaluated on economic merit against alternatives; and they are not subject to PJM's dispatch.

Self-scheduled demand reductions under the current PJM market rules therefore lack the "capability to balance supply and demand as an alternative to a generation resource."²⁵ Self-scheduled demand response does not aid in balancing supply and demand for the simple reason that that it occurs without input or direction from the market administrator. As a result, self-scheduled demand reductions do not provide the "service" to the energy markets discussed by the Commission and, therefore, are not eligible for compensation under Order No. 745.

PJM therefore is revising its rules on Economic Load Response participation in the real-time market to give PJM the minimum amount of notice and information needed to satisfy the Order No. 745 objectives, while preserving substantial control and flexibility for demand response providers seeking to participate in the real-time market, in a manner very similar to the current self-scheduling provisions. PJM's compliance revisions to its market rules preserve the flexibility currently provided to demand resources under the current PJM market rules on self-scheduling, but conform to the Order No. 745 requirements for load reductions that are compensable under that rule, i.e., that they must be capable of "balanc[ing] supply and demand as an alternative to a generation resource;" their "dispatch" must be "cost-effective" under "the net benefits test;" and they must "clear[] in the RTO's or ISO's economic dispatch."²⁶ PJM

²³ *Id.*, § 1.5A.9 ("Demand Resources that are self-scheduled . . . shall not be dispatched by [PJM].").

²⁴ *Id.*, § 1.10.3(b) ("The offered prices of resources that are self-scheduled, or otherwise not following the dispatch orders of the Office of the Interconnection, shall not be considered by the Office of the Interconnection in determining Locational Marginal Prices").

²⁵ Order No. 745 at P 2.

²⁶ *Id.* at PP 2, 3.

understands the need to ensure PJM market rules concerning dispatchability are flexible so that they do not create an unreasonable barrier to participation for demand response resources. PJM has worked through the stakeholder process to develop flexible offer and scheduling rules to ensure robust participation. As shown below, PJM's revised offer and scheduling rules will allow load reduction resources to participate in PJM's energy markets but still retain substantial flexibility and control over their load reduction commitments in the real-time market. Therefore, parties that currently self-schedule their reductions should have a clear path to participation in the PJM markets, and will have the incentive of receiving full LMP compensation (rather than the current rule of LMP minus generation and transmission) to do so. Notably, while the LMP must exceed the established threshold in order to meet the net benefits criteria of Order N. 745, Economic Load Response providers still may offer their reductions into the PJM market at a price that is less than the threshold; if they are dispatched and the LMP exceeds the threshold price, they will be compensated at the full LMP as required by Order No. 745.

Moreover, these Order No. 745 compliance changes will improve PJM's capability to rely upon economic demand response as an operational resource—a capability unavailable to PJM under a pure self-scheduling regime. Therefore, PJM's compliance with Order No. 745 will provide operational and economic benefits to the PJM region because it will incentivize demand resources to become more viable operational resources for the RTO.

The revised real-time market rules will continue to offer considerable flexibility to demand responders. Unlike the vast majority of generation in PJM (which are committed as capacity resources), demand response resources are not required to offer their reductions into PJM's day-ahead energy market. Under PJM's proposal, participants can offer into the real-time market to the extent they have not already scheduled their load reductions in the day-ahead market, but they are not required to submit an offer into the Day-ahead market to be eligible to submit a bid into the Real-time market.

To provide a minimum amount of advance notice to ensure that the eligibility criteria can be satisfied, offers for demand reduction into the Real-time market must be submitted by 6:00 p.m. the day before each Operating Day. They must include the same offer data described above for day-ahead market offers. The 6:00 p.m. offer deadline mirrors the current deadline for the generation rebidding period in PJM's market rules. PJM posts the day-ahead scheduled quantities and prices by 4:00 p.m. each day before the Operating Day and allows generators to review those results and submit offers for their uncommitted units by 6:00 p.m. Offers submitted during the rebidding period that are subsequently dispatched by PJM and respond consistently with that dispatch are settled at the real-time price.²⁷ Thus, the re-bidding period is in effect the opening round

²⁷ See Operating Agreement, Schedule 1 § 1.10.9(a). Generators that submitted bids in the rebidding period are paid the real-time, and not day-ahead, price, if the bid is accepted and dispatched. *Id.*

of real-time market offers, and the enclosed rule changes similarly require Economic Load Response participants that wish to participate in the real-time market to submit their offers by 6:00 p.m. the day before.

Even after that deadline, however, the enclosed rules permit Economic Load Response participants considerable flexibility. Specifically, Economic Load Response providers that submitted offers in the real-time market can change the hourly quantity of their offer up to three hours prior to the operating hour. While the price or other parameters of the offer may not be changed, participants can increase or decrease the megawatts available for reduction, even to the point of effectively rescinding their offered reductions by reducing the offered reduction quantity to zero. This ability to submit offers, but then dramatically change the offered quantity on as little as three-hour's notice, comes close to the level of flexibility currently enjoyed by self-scheduled load reductions, but provides PJM with more operational and dispatch information while allowing Economic Load Response providers to take advantage of the increased compensation level established by Order No. 745.

The prescribed three-hour notice is the minimum PJM requires to select and dispatch the offered reductions in the manner contemplated by Order No. 745. PJM's Security Constrained Economic Dispatch system continually conducts a two-hour "look-ahead," to enable dispatchers to anticipate system conditions and evaluate their alternatives for near-term dispatch actions. By allowing Economic Load Response participants to make their final decisions on offered reduction quantities three hours before the operating hour, those decisions can be received, processed, and reflected in the conditions and options available to the dispatchers in their two-hour look-ahead. This, therefore, is the minimum notice needed to ensure that offered load reductions are capable of balancing supply and demand through economic dispatch and satisfy the net benefits test.²⁸

Finally, to correctly consider whether load reductions can balance supply and demand "as an alternative to a generation resource,"²⁹ load response resources that participate in PJM's markets must be subject to balancing Operating Reserves charges if they do not follow PJM's dispatch instructions, in the same manner as other resources that are dispatched by PJM. PJM's market rules prescribe specific deviation levels that warrant a conclusion that a resource is not following PJM's dispatch, describe how to calculate those deviations, and assess balancing Operating Reserve charges for resources that exceed those deviation levels.³⁰ To clarify the rules applicable to dispatchable load

²⁸ Although generators are allowed to make certain changes as late as one hour before the operating hour, the scope of those changes is quite narrow, and does not include the flexibility provided here to change offered quantities. *See* Operating Agreement, Schedule 1 § 1.10.9(b).

²⁹ Order No. 745 at P 2.

³⁰ *See* Operating Agreement, Schedule 1 § 3.2.3(o).

reduction resources under similar circumstances, PJM is revising the current balancing Operating Reserves rules to make clear that they apply to generation resources, and is adding a new subsection specific to load reduction resources.

For this purpose, PJM is setting a deviation bandwidth for Economic Load Response of 20%. In other words, a load reduction resource will be deemed not to be following PJM's dispatch instructions, and will be assessed balancing Operating Reserves charges, only if its actual load reduction is less than 80%, or more than 120%, of the desired reduction established through the offer and scheduling process. This deviation bandwidth is the same as the largest deviation bandwidth allowed to generation resources under the current market rules. Use of the broadest comparable tolerance level for load response deviations from scheduled quantities will facilitate the transition of load reduction resources to participation in PJM's dispatch and ensure there are no hurdles to that transition

e. Other Conforming Changes.

The market rule changes described above to enable Economic Load Response resources to participate in the real-time energy market in the manner contemplated by Order No. 745 effectively replace the existing rules on real-time market participation that do not enable satisfaction of the Order No. 745 criteria. Given these changes, PJM will no longer offer LMP-based compensation to Economic Load Response resources that do not submit price offers; do not subject themselves to PJM's economic dispatch; and that provide only last-minute notice of their reductions. Moreover, Order No. 745 rejected the type of cost allocation, i.e., allocation to the load-serving entity,³¹ that PJM currently uses to recover the cost of its LMP-based payments to self-scheduled demand response. Nor can self-scheduled load reductions be allocated using the Order No. 745-prescribed method, since that is dependent on the dispatchability and net benefits requirements, which self-scheduled reductions do not satisfy.

Therefore, PJM is removing references to self-scheduling from its Economic Load Response rules. Specifically, PJM is revising sections 1.5A.9, 1.7.20(b), 3.3A.5(a), 3.3A.6(a), and 3.3A.8(a)(v)(1) to remove language pertaining to self-scheduled load response in the PJM markets.

This does not mean that self-scheduling of load reductions will not occur in the PJM Region. Market participants still can and will manage and reduce their loads to save energy costs. They simply will not receive additional compensation from the PJM market as a result of such reductions—unless they satisfy the Order No. 745 standards.

³¹ Order No. 745 at P 101.

B. Net Benefits Test.

1. Order No. 745 Requirements.

In Order No. 745, the Commission directed each RTO and ISO to identify “the point along the supply stack for each month beyond which the benefit to load from the reduced LMP resulting from dispatching demand response resources exceeds the increased cost to load associated with the [reduced] billing unit[s]” resulting from the demand response.³² The Commission described the net benefit threshold price level in formulaic terms as the price “where: $(\Delta \text{LMP} \times \text{MWh consumed}) > (\text{LMP}_{\text{NEW}} \times \text{DR})$; where LMP_{NEW} is the market clearing price after demand response (DR) is dispatched and ΔLMP is the price before DR is dispatched minus the market clearing price after DR is dispatched.”³³ Specifically, the Commission directed each RTO and ISO to:

- select a representative supply curve for the month based on historical data and the previous year’s supply curve;³⁴
- update the data for significant changes in resource availability and fuel prices;³⁵
- smooth the supply curve using numerical methods;³⁶ and
- find the point on the curve above which a one megawatt reduction in quantity that is paid LMP would result in a larger percentage decrease in price than the corresponding percentage decrease in quantity.³⁷

Order No. 745 explains that the price point identified in the last step “will fall in the area where the supply curve becomes inelastic,”³⁸ i.e., where elasticity (defined as the percentage change in quantity supplied divided by the percentage change in price) is less than or equal to one.³⁹ Beyond that point, a one percent reduction in the quantity supplied will result in more than a one percent decrease in price; therefore, beginning at that point, “a reduction in quantity everywhere along an upward sloping supply curve would be cost-effective.”⁴⁰ Put in more practical terms, the threshold price will be set at

³² Order No. 745 at P 79.

³³ *Id.* at P 79 n.162.

³⁴ *Id.* at P 79.

³⁵ *Id.*

³⁶ *Id.* at P 79 n.161.

³⁷ *Id.*

³⁸ *Id.* at P 80.

³⁹ *Id.* at P 80 & n.163.

⁴⁰ *Id.* at P 79 n.161 & P 80 n.163.

the point on the supply curve at which “small decreases in generation being called to serve load will result in price decreases sufficient to offset the billing unit effect.”⁴¹

The Commission directed each RTO and ISO to include in its compliance filing “the data, analytical methods and the actual supply curves used to determine the monthly threshold prices for the last 12 months to show how the RTO or ISO would calculate the curves.”⁴² The Commission also directed each RTO and ISO to post to its website the net benefits test methodology, analysis, and resulting prices for the most recent twelve months.⁴³ Once the Order No. 745 directed tariff changes become effective, each RTO and ISO is to update the analysis each month and post it by the 15th day of the month prior to the month in which the price threshold will be applied.⁴⁴ Updates are to add each new month’s data to the curves, and to modify the curves as necessary to reflect any significant changes in the composition or scope of the supply curve.⁴⁵

2. Market Rule Changes to Comply with Order No. 745.

PJM is adding to the tariff a statement of the general requirement and objective of the net benefits test, a specification of the monthly recalculation and posting requirements, and a step-by-step description of the threshold price calculation method.⁴⁶ PJM also includes with this filing, as Attachment A, B, and C, supply curves and calculated threshold prices, with supporting details, for the last 12 months, and is posting that information as well to its website.⁴⁷

As required by Order No. 745, the tariff directs PJM to identify each month “the price on a supply curve, representative of conditions expected for that month, at which the benefit of load reductions provided by Economic Load Response Participants exceed the costs of those reductions to other loads.” The revised tariff incorporates Order No. 745’s formulaic definition of the desired threshold price, i.e., the point where “(Delta LMP x MWh consumed) > (LMP_{NEW} x DR), where LMP_{NEW} is the market clearing price

⁴¹ *Id.* at P 80.

⁴² *Id.* at P 81.

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ See Operating Agreement, Schedule 1 proposed § 3.3A.4.

⁴⁷ The material is available at:

<http://www.pjm.com/markets-and-operations/demand-response/net-benefit-test-results.aspx>

after Economic Load Response is dispatched and Delta LMP is the price before Economic Load Response is dispatched minus the LMP_{NEW}).⁴⁸

The revised tariff also incorporates the Order No. 745 requirement that PJM “update and post the Net Benefits Test results and analysis for a calendar month no later than the 15th day of the preceding calendar month.”⁴⁹

The heart of the changes to this section, however, is its description of the six-step method PJM will use to identify the threshold price that satisfies the net benefits test. Each of these steps is discussed below.

a. Retrieve Generation Offers.

The revised tariff describes the first step in the process as “[r]etrieve generation offers from the same calendar month (of the prior calendar year) for which the calculation is being performed, employing market-based price offers to the extent available, and cost-based offers to the extent market-based price offers are not available.”⁵⁰ The supply stack of interest here is the generation stack, as the objective of the test is to identify the point at which scheduling and dispatching demand resources to displace higher-cost generation resources first becomes beneficial. Order No. 745 makes this clear when it characterizes the net benefit point as the location on the supply curve at which “small decreases in generation being called to serve load” result in price decreases that offset the billing unit effect of reduced load.⁵¹ Consistent with Order No. 745, PJM will base the supply curves for the calendar month in which the threshold price will apply (sometimes referred to in these tariff revisions, and in the PJM Manuals that provide more detail on this process, as the “study” month) on the same calendar month of the prior calendar year (sometimes referred to as the “reference” month).

PJM maintains a database of historic generation offers; those offers are posted to the public portion of PJM’s website on a four-month lag (with the codes identifying the specific generator masked).⁵² Accordingly, this existing database provides a ready source for the data required for the Order No. 745 net benefits test. The revised tariff specifies

⁴⁸ See revised section 3.3A.4.

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ Order No. 745 at P 80.

⁵² As part of the effort to protect confidentiality and limit the likelihood that the offers of individual resources can be identified, PJM does not post the fuel type used by a resource.

preferential reliance on market-based price offers (rather than cost-based offers)⁵³ to reflect the price that, absent mitigation, the seller wishes to receive as a condition of selling its energy into the PJM market. Moreover, considering all nodes and all hours in the PJM Region, most accepted offers are market-based,⁵⁴ indicating that market-based offers are an appropriate default value for the representative supply curves. Conversely, if PJM used cost-based offers, it would need to make assumptions about the application of mitigation, and those administrative judgments could significantly influence the results of the test.

b. Adjust the Offers for Changes in Fuel Prices.

Implementing the directive of Order No. 745 to adjust the historic offers for changes in fuel prices, the revised tariff provides that PJM will “[a]djust a portion of each prior-year offer representing the typical share of fuel costs in energy offers in the PJM Region, as specified in the PJM Manuals, for changes in fuel prices based on the ratio of the reference month spot price to the study month forward price.”⁵⁵ In the PJM Region, the price of fuel typically represents eighty to ninety percent of the energy offer, with the rest of the offer reflecting variable operations and maintenance expenses or other costs. The precise factor can vary over time; PJM accordingly will state the specific factor in the manuals. For the initial net benefits tests calculations included in this filing, PJM is using a factor in the middle of this range, i.e., eighty-five percent.

As Order No. 745 prescribes a monthly analysis, the fuel adjustment will be determined for each month, i.e., average spot fuel prices for the reference month will be compared to average forward prices for the study month, and PJM will raise or lower the price of the share of each offer typically represented by fuel to reflect the fuel price difference from the reference month to the study month.

The fuel price adjustments will be based on published indices for the three predominant fuel types in the PJM Region—coal, oil, and natural gas—and determined separately for each fuel type. The revised tariff specifies that “natural gas shall be priced at the Henry Hub price, number 2 fuel oil shall be priced at the New York Harbor price, and coal shall be priced as a blend of coal prices representative of the types of coal

⁵³ If no market-based price is available, PJM will use the least expensive cost-based offer.

⁵⁴ See Monitoring Analytics, LLC, Independent Market Monitor for PJM, “2010 State of the Market Report for PJM: Volume 2, Detailed Analysis,” March 10, 2011 at 41. Day-ahead unit-hours that are offer capped have never exceeded 0.5 percent while real-time unit-hours capped have not exceeded 1.2 percent.

⁵⁵ See Operating Agreement, Schedule 1 proposed § 3.3A.4. Where generators offer multiple points on a curve, each point on the curve will be adjusted for fuel costs.

typically utilized in the PJM Region.”⁵⁶ The Henry Hub price is appropriate since it is a major pricing point for natural gas and the focus of this analysis is not determining a PJM-delivered fuel price but rather reasonably reflecting *changes* in fuel prices from one year to the next. As fuel transmission costs are comparatively stable, changes in the Henry Hub price provide a good indication of changes in the price of natural gas delivered for electric generation use in the PJM Region. For fuel oil, changes in the New York Harbor price will reasonably reflect changes in fuel oil prices in the Mid-Atlantic and other portions of the PJM Region. Moreover, changes in the price of no. 2 fuel oil also should provide a good indication of changes in the price of no. 6 fuel oil, which is used in PJM but does not trade on a futures market.

For coal, generators in the PJM Region typically obtain their fuel supplies from sources in the Powder River Basin, Northern Appalachia, or Central Appalachia. The exact mix can change from time to time; PJM will therefore state and update those values as necessary in the PJM Manuals. For the initial calculations in this filing, PJM has selected a representative mix of 20% Powder River Basin, 50% Northern Appalachia, and 30% Central Appalachia.

c. Combine the Offers to Form a Daily Supply Curve.

The revised tariff prescribes the third step as “[c]ombine the offers to create daily supply curves for each day in the period.”⁵⁷ Based on the adjusted generation offers for the relevant day, PJM will determine the amount of supply available from each generator at each price point under economic conditions. The result will be a curve for each day of the reference month with prices from \$1 to \$999 and the amount of energy offered at each price point.

Order No. 745 does not require, and the Net Benefits Tests filed here does not include, multiple locational supply curves and price thresholds. Order No. 745 prescribes that “[t]he ISOs and RTOs are to select *a* representative supply *curve* for the study month.”⁵⁸ Attempting to define multiple locational curves would increase the complexity of the calculation exponentially and force PJM to make assumptions about congestion levels, price separation points, and the association of specific resources with varying specific locations for every day of the month.⁵⁹ Given the influence such assumptions would have on the final result, PJM could as well dispense with any calculations and

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ Order No. 745 at P 79 n.161 (emphasis added).

⁵⁹ In order to account for different patterns of congestion, it would be necessary in theory to estimate a supply curve and determine a net benefits threshold for every possible combination of transmission constraints that may occur in PJM—a virtually impossible task.

simply assume a net benefits threshold price. The Commission expressly sought to avoid these sorts of complications by directing each RTO and ISO to adopt a straightforward, standardized Net Benefits Test, and deferring for future consideration a more complicated dynamic determination of the threshold price.⁶⁰

d. Average the Daily Curves to Produce a Single Monthly Curve.

The revised tariff specifies as the fourth step “[a]verage the daily curves for each day in the month to form an average supply curve for the study month.”⁶¹ This step, which yields the monthly average amount of energy offered at each price point, provides the representative supply curve for the reference month required by Order No. 745. Averaging the curves from every day of the most recent occurrence of the same calendar month provides a simple, transparent, and easily reproducible method of determining a representative supply curve for the study month. While the supply curves for one calendar day, e.g., July 22, could vary significantly from year to year, the average of the curves for *all days* in the most recent July should provide a reasonably representative “July curve” for use to set the threshold price for the month of July.

This approach also provides a reasonable solution to the issue of resource availability raised by Order No. 745. Making administrative adjustments to reflect resource availability is potentially quite challenging. It is one thing to remove from the stack resources that were available for the reference month but not available for the study month; it is something else entirely to *create price offers* for resources that were unavailable for the reference month but are available for the study month. Tests that look to the market to define important parameters (e.g., the market price at which load response provides net benefits) should be based to the greatest extent practicable on actual offers made by market participants, and not on PJM-devised offers. Fortunately, there is no compelling need to rely on PJM-devised offers in this context. As noted above, the Net Benefits Test determines a single supply curve for the PJM Region. While individual resources go in and out of service at various times, when viewed on a region-wide basis, the net effect on the estimated average supply curve of all outages for all resources should not vary greatly from one year to the next. Moreover, averaging the curves for every day in the reference month will further capture, and smooth, daily variances in net availability of resource types that might typically occupy different levels of the supply curve. Put more simply, the large (region-wide) view helps mitigate the significance of individual availability differences, while daily averaging ensures that underlying daily net variances in availability are fully taken into account.

Note, however, that the filed test takes a different approach to a different type of unavailability. Averaging, as discussed above, provides a reasonable solution for

⁶⁰ *Id.* at P 84.

⁶¹ See Operating Agreement, Schedule 1 proposed § 3.3A.4.

maintenance or mechanical unavailability. Applying this test in the PJM Region also presents issues of what might be termed “scope” availability, i.e., the availability to the PJM market of generation in a transmission zone that is newly added to (or removed from) the PJM Region. When zones are added, those generation resources will be available in a study month, but not included in PJM’s offer database for the reference month. The revised tariff addresses this issue in Step 1 of the Net Benefits Test by directing PJM to use “the most recent generation offers that best correspond to the characteristics of the calendar month for which the calculation is being performed, provided that at least 30 days of such data is available.”⁶² If less than 30 days of data is available, PJM will simply exclude those resources from the supply curve.⁶³ This approach is reasonable because it ensures that resources that are actually available to PJM in the study month are included in the calculation, so long as there is enough actual market data available from those resources that PJM can reasonably determine representative offers from those resources.

e. Smooth the Curve.

As required by Order No. 745, the fifth step in the Net Benefits Test in the revised tariff is to “[u]se a non-linear least squares estimation technique to determine an equation that reasonably approximates and smooths the average supply curve.”⁶⁴ This “numerical method” does “smooth the curve,” as required by Order No. 745,⁶⁵ in that it eliminates steps and plateaus in the raw curve, but it also provides an equation that describes the curve mathematically and that can be used in the final step of the test to determine the threshold price.

Thus, this step in the process can best be described as identifying an equation whose results best “fit” the raw curve. As shown in Attachment C to this filing, PJM tested equations of several different forms, i.e., linear equations, logarithmic equations, second-order polynomial equations, third-, fourth-, fifth-, and even sixth-order polynomial equations. In each case, PJM superimposed the curve resulting from the equation with the raw curve, to gauge how well the equation describes the actual supply curve. As shown in the attachment, the best fit was provided by a power-function, or exponential, equation, i.e., one in which a key component is a term with a polynomial as its exponent.

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ Order No. 745 at P 79 n.161.

More specifically, the best fit calculation method for a currently representative PJM supply curve, with price as a function of MW-quantity, is provided by a non-linear, least squares power function equation of the general form:

$$LMP = a^{(b \cdot mw - c)} + d$$

This is only the general form of the equation. The actual equation will vary each month and will be populated with values for the variables a, b, c, and d that provide the best numerical description of the supply curve for the study month. Moreover, while this particular equation form appears to work well for the current supply curve, that may not always be the case. The revised tariff requires PJM to use a non-linear least-squares method, but it leaves PJM necessary flexibility to use an equation form that provides the best fit to the actual supply curve for the month at issue. PJM will identify in its manuals the general equation form in use at any particular time.

f. Find the Net Benefits Price Point.

The last step in the Net Benefits Test under the revised tariff is to “[d]etermine the net benefit level as the point at which the price elasticity of supply is equal to 1 for the estimated supply curve equation established in Step 5.” This follows directly from the Commission’s guidance in Order No. 745 that the net benefit price “will fall in the area where the supply curve becomes inelastic,”⁶⁶ i.e., where elasticity is less than or equal to one.⁶⁷

As the Commission also explained, elasticity can be defined as the percentage change in quantity supplied divided by the percentage change in price.⁶⁸ Elasticity thus lends itself to formulaic description, and that formula can be combined, using calculus, with the formulaic “best-fit” description of the supply curve to find the point on the curve at which supply becomes inelastic, i.e., where elasticity equals one.

The Commission’s definition of elasticity can be expressed in an equation as follows (where p is price and q is quantity):

$$Elasticity = \frac{1}{\frac{dp}{dq}} * \frac{p}{q}$$

The denominator of the first term, i.e., change in price relative to change in quantity, describes, among other things, the quantity derivative of a supply curve. That term can

⁶⁶ *Id.* at P 80.

⁶⁷ *Id.* at P 80 n.163.

⁶⁸ *Id.*

be replaced, therefore, with the equation derived in Step 5 to describe the PJM supply curve (or, more precisely, with the derivative form of that equation). Thus:

$$\frac{dp}{dq} = \log_e(a) * b * a^{(b*mw-c)}$$

Substituting the terms, the formula for the elasticity of the representative PJM supply curve is:

$$Elasticity = \frac{1}{\log_e(a) * b * a^{(b*mw-c)}} * \frac{lmp}{mw}$$

With this type of equation, PJM can compute elasticity for each point along the curve and find the price at which elasticity is equal to one. This price is the threshold price of the Net Benefits Test.

The approach adopted here, i.e., using an exponential function to describe the supply curve and an elasticity formula to find the net benefit price point, solves a difficult problem PJM staff encountered when it first attempted to define a net benefit price under Order No. 745. Supply curves are not smooth, continuous functions. They have areas where they are locally flat and locally steep. When PJM staff attempted the most obvious method of running the test—stepping through each point of the curve and comparing costs and benefits—the results were ambiguous and unsatisfactory. The test would oscillate between passing and failing as it progressed along the curve, yielding varying results in different parts of the curve. This step-wise, iterative approach therefore failed to produce a single point at which there are net benefits. Under that unsatisfactory approach, the first point at which the test passed might be a very different LMP than the last point at which the test failed.

Using the elasticity formula eliminates this ambiguity. The elasticity of the “best-fit” supply curve is a very high number at the lowest portion of the curve and continually decreases as the curve ascends. There are no vertical or horizontal segments, and the test results do not oscillate between passing and failing. This method therefore fulfills the Commission’s expectation in Order No. 745 that the test will identify a single price point beyond which dispatch of load response is cost effective.

3. 12-Month Analysis Results and Supporting Data.

Order No. 745 requires each RTO to submit with its compliance filing the data, analytical methods, and supply curves used to determine the monthly threshold prices for the most recent 12 months, to demonstrate how the RTO would calculate the curves.

As shown on Attachment A to this filing, the method described above produced the following net benefit threshold prices for the months of August 2010 through July 2011:

Month	Net Benefits Point
August, 2010	\$35.57
September, 2010	\$34.07
October, 2010	\$38.10
November, 2010	\$36.83
December, 2010	\$37.04
January, 2011	\$40.27
February, 2011	\$40.49
March, 2011	\$38.48
April, 2011	\$36.76
May, 2011	\$34.68
June, 2011	\$35.09
July, 2011	\$36.78

Attachment A includes, for each month, the monthly average supply curve, the “best-fit” supply curve, the price adjustment ratio for each fuel type,⁶⁹ the “best fit” non-linear least squares equation with the values inputted, and the elasticity formula with its values inputted. PJM also provides for each month, as Attachment B, a tabular listing of the values at each point on both the average and best fit curves. The underlying daily offer data is available on PJM’s website.⁷⁰ To best replicate how the test will be conducted when these tariff changes become effective, PJM conducted the test for each month as if it were performed the 15th day of the prior month (e.g., the test for March 2011 used fuel price futures for March delivery that were available as of February 15).

C. Compensation at Full LMP.

1. Order No. 745 Requirements.

Order No. 745 requires that load response offers that are capable of balancing supply and demand as an alternative to a generation resource, that clear in PJM’s economic dispatch, and that satisfy the Net Benefits Test must be paid full LMP, just as a

⁶⁹ The pricing data used to calculate the fuel price ratios is published, but protected by copyright, so it cannot be reproduced here or posted on PJM’s website. Interested parties can obtain that information directly from the publishers.

⁷⁰ The historic offer data is available at: <http://www.pjm.com/markets-and-operations/energy/real-time/historical-bid-data/unit-bid.aspx>.

generation resource that is dispatched by PJM for the benefit of the region is paid full LMP.⁷¹

2. Market Rule Revisions to Comply with Order No. 745.

PJM's market rules currently provide that Economic Load Response will be compensated at LMP less certain generation and transmission charges. Therefore, to comply with Order No. 745, PJM is removing the current references in sections 3.3A.5 and 3.3A.6 to the deduction from LMP of generation and transmission charges. PJM also is removing provisions in sections 1.5A.3(1)(a)(i), (b)(i) and 1.5A.10 that are intended to identify and verify the generation and transmission charges applicable to particular Economic Load Response participants. As these amounts will no longer be deducted, there is no longer any need to identify or verify them.

PJM is also making a conforming change to its market rules relating to compensation for end-use customers that have retail contracts indexed to PJM's LMP. Those customers are compensated only if they participate in PJM's real-time energy market and are dispatched by PJM.⁷² If they meet those conditions, they are compensated in PJM's market, but only in an amount equal to the difference between the accrued value of their retail savings and the total offer value PJM accepted to dispatch the customer. Order No. 745 and the other market rule revisions described above, which pay customers full LMP regardless of their retail contracts, and which compensate load reductions up to the full value of their offer when they follow PJM's dispatch, effectively supplant this existing rule, which provides only very limited compensation in narrowly defined circumstances. Accordingly, there is no longer any need to provide separate compensation rules for this type of demand response in sections 3.3A.5 or 3.3A.6.

Lastly, PJM is revising section 2.2 to make clear that offers from Economic Load Response participants can set price in either the day-ahead or real-time energy markets.

D. Cost Allocation.

1. Order No. 745 Requirements.

In Order No. 745, the Commission required that the costs of paying full LMP for reductions in demand should be allocated "proportionally to all entities that purchase from the relevant energy market in the area(s) where the demand response reduces the market price for energy at the time when the demand response resource is committed or dispatched." The Commission expressly rejected "[a]ssignment of all costs to the LSE

⁷¹ Order No. 745 at PP 2, 47.

⁷² See the existing Operating Agreement, Schedule 1 § 3.3A.4(d).

associated with the demand response provider,” because that allocation “would not include others who benefit from the demand response.”⁷³

2. Market Rule Revisions to Comply with Order No. 745.

PJM’s market rules currently have the effect of allocating the costs of payments for load reductions by Economic Load Response participants to the LSE that is responsible for serving the load that was reduced. Accordingly, PJM’s current allocation of LMP-based payments to Economic Load Response participants is contrary to Order No. 745 and must be modified.

For cost allocation, Order No. 745 instructs RTOs and ISOs to identify “the area(s) where the demand response resource reduces the market price for energy at the time when the demand response resource is committed or dispatched.”⁷⁴ As discussed above, Economic Load Response can only receive LMP-based payments when the LMP is at or above the net benefit threshold price. When that threshold is reached, and loads are reduced in response, then any area where the price is at or above that threshold price can reasonably be deemed to have been affected by the load reduction.

Areas where the price is below that threshold cannot attribute their low price to the load reductions, because compensable reductions have not been triggered in that area (since the price is too low), and compensable reductions in other areas have, by definition, responded to a higher price in the other area, indicating that the higher-priced area where the load reductions occurred has price-separated from the lower-priced area. As the Commission recognized in Order No. 745, price separation due to transmission constraints can prevent loads in one area from benefiting from resources dispatched in another area.⁷⁵

Conversely, it is reasonable to infer that areas where the price is above the Net Benefits Test threshold price at the time of a compensable load reduction benefit from the load reductions. As explained above, the Net Benefits Test price threshold is calculated on a region-wide basis (rather than on a locational basis), so allocating the costs of paying for load reductions at that price level on a similarly broad basis is justified. Moreover the comparatively low level of the Net Benefits Test price threshold means that it is likely that the LMPs in higher-priced zones benefited from the price effect of the load reductions even if those zones subsequently separate, at a still higher price, from the zone where the compensable load reduction occurred.

⁷³ Order No. 745 at P 101.

⁷⁴ Order No. 745 at P 100.

⁷⁵ *Id.* at P 100.

The revised tariff reasonably simplifies the allocation process by using transmission Zones as the smallest relevant area. While constraints can arise within Zones, the areas affected by such constraints are dynamic and not fixed in advance. As noted above, the Commission has deferred dynamic implementation of the Net Benefits Test for future consideration. Moreover, there is not likely to be much intra-Zone price separation *below* the comparatively low level of the net benefit price thresholds identified in this filing. As explained above, it is price separation occurring *below* the net benefit price threshold that defines the scope of cost allocation.

The cost allocation rules that apply these principles appear in section 3.3A.5 of the revised tariff, reading in part:

The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average real-time Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, in accordance with the formula prescribed in section 3.3A.5(d).

As can be seen, the allocation excludes the “make-whole” portion of payments above LMP (e.g., start-up or minimum down time costs payable when the resource follows PJM’s dispatch), which are socialized as operating reserves. The costs of the payments are recovered ratably from all exports from PJM and all loads in the identified Zones, based on a formula stated in the section.

The above section deals with the cost of payments to load reductions scheduled through the real-time energy market. Section 3.3A.6 applies the same rule, i.e., recovery based on real-time load and exports, to the cost of payments for load reductions scheduled through the day-ahead market. The stakeholders overwhelmingly supported allocating these costs to real-time loads; all three proposals before the stakeholders agreed on allocation to real-time load and exports.

E. Measurement and Verification.

1. Order No. 745 Requirements.

In Order No. 745, the Commission directed each RTO and ISO to review its demand response measurement and verification rules “and develop appropriate revisions and modifications, if necessary, to ensure that their baselines remain accurate and that

they can verify that demand response resources have performed.”⁷⁶ The Commission elaborated that the purpose of the review is to “ensure that appropriate baselines are set and that demand response will continue to be adequately measured and verified as necessary to ensure the performance of each demand response resource.”⁷⁷ Changes to those rules should be proposed if “needed to ensure that measurement and verification of demand response will adequately capture the performance (or non-performance) of each participating demand response market participant to be consistent with the requirements of this Final Rule.”⁷⁸

2. Market Rule Revisions to Comply with Order No. 745.

Upon careful review, PJM has determined that its current measurement and verification (“M&V”) rules are not adequate to meet the Order No. 745 objective “to ensure that their baselines remain accurate and that they can verify that demand response resources have performed.”⁷⁹

First, as discussed above, Order No. 745 anticipates that qualifying load reductions will participate in PJM’s economic dispatch as a cost-effective option to balance supply and demand in place of generation resources. For effective participation in PJM’s dispatch, it is critical that PJM have a reliable and reasonably accurate understanding of the actual reduction level that can be expected from that dispatch. As also discussed above, PJM is not requiring Economic Load Response participants to install telemetering capabilities as a condition of participating in PJM’s markets. With or without telemetering, PJM must have an accurate Customer Baseline Load (“CBL”) method. If the CBL method is not accurate, and actual reductions differ substantially from the reduction anticipated by the dispatcher, then PJM will have displaced more (or less) generation than it expected, thereby degrading the economic efficiency of the dispatch and increasing the likelihood of short-term operational challenges for the dispatchers.

Second, Economic Load Response that qualifies under the Order No. 745 criteria will now set price in both the day-ahead and real-time energy markets. If the scheduled quantities in day-ahead or real-time are not accurate, then the resulting prices that incorporate those quantities in the LMP calculations will be incrementally less accurate. Absent telemetered data, the CBL calculation is PJM’s primary means of securing accurate information for its LMP calculations.

⁷⁶ Order No. 745 at P 94.

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ Order No. 745 at P 94.

Third, Order No. 745 is dramatically increasing the compensation offered in the PJM Region for load response, and thereby greatly increasing the incentive for market participants to seek payments for reductions that may exist more on paper than in the real world. In 2010, generation and transmission charges represented more than half of the LMPs for settled Economic Load Response reductions. Therefore, paying full LMP, without the generation and transmission offset, could more than double the compensation paid to Economic Load Response. The incentive to seek advantages through the CBL rules would be correspondingly doubled. Accordingly, it is unsound to countenance any known inaccuracies or deficiencies in its current CBL rules. Any such deficiencies must be corrected.

Fourth, as explained above, the Order No. 745 compensation rule effectively moots and displaces the current PJM market rule on compensation for load reductions by end-users with retail contracts that are indexed to PJM's LMP. That current rule offers very limited wholesale market compensation to such customers, even less than the LMP minus generation and transmission approach currently available to customers without such LMP-indexed retail contracts. Those LMP-indexed customers now will have an opportunity to obtain compensation based on full LMP from the PJM market, and PJM reasonably expects that many of them will now seek to participate in PJM's markets to secure that increased compensation. Those customers also tend to be larger and more sophisticated energy users, with larger and less predictable loads. Therefore, it is essential that PJM put in place CBL rules that can accommodate an expected influx of these larger customers and ensure more accurate and reliable measurement of their more variable loads.

To address these direct impacts of Order No. 745, PJM is filing several changes to its M&V rules to ensure that they "adequately capture the performance (or non-performance) of each participating demand response market participant." PJM is greatly aided in this effort by a comprehensive study recently completed for PJM by KEMA, Inc.,⁸⁰ that was expressly "designed to be a comprehensive examination of the issues surrounding the development of accurate baselines."⁸¹ That comprehensive analysis compared numerous alternative methods of measuring customer baseline loads and tested those methods for accuracy and other attributes, i.e., bias and variability, using the two most recent years of actual load reduction data in the PJM Region. The KEMA Report found that measuring CBL using the average of the highest four out of the five most recent load days over a defined period, with an additive adjustment, "performed well across all segments, time periods and weather conditions, *except* for predicting loads for

⁸⁰ That study, KEMA, Inc., "PJM Empirical Analysis of Demand Response Baseline Methods" (Apr. 20, 2011) ("KEMA Report"), is available on PJM's website at: <http://pjm.com/~media/committees-groups/subcommittees/drs/20110613/20110613-item-03b-cbl-analysis-report.ashx>

⁸¹ *Id.* at 1.

variable load customers.”⁸² KEMA therefore recommended that variable-load customers be “segmented,” so that PJM could apply an alternative, better-performing CBL rule for those customers.⁸³ The KEMA report also found that a weather-sensitive adjustment resulted in poorer performance on all three empirically tested attributes, i.e., accuracy, bias, and variability.⁸⁴

Given these findings, PJM’s CBL rules must be revised to ensure that they continue to satisfy the objectives specified in Order No. 745. As shown above, the Order No. 745 requirements as applied in the PJM Region heighten the need for accurate CBL measurement, and PJM has in hand a comprehensive, empirical, third-party analysis finding specific shortcomings in the accuracy of PJM’s current CBL methodology, and making specific recommendations to correct those identified deficiencies. Notably, the most significant identified problem, i.e., the inaccuracy of PJM’s current method as applied to variable-load customers, is directly implicated by the expected increase in program participation by, and PJM’s dispatch of, larger end-users with less predictable loads, as described above.

Accordingly, PJM is revising its CBL rules to distinguish between variable and non-variable loads. In this context, “non-variable” simply means the portion of loads for which the adopted default CBL method is demonstrably accurate, using the same statistical tool KEMA employed for its empirical measure of the accuracy of various CBL methods. For this purpose, KEMA uses, and PJM adopts in the revised tariff, an hourly relative root mean square error test.⁸⁵ Conversely, “variable” simply means the portion of loads for which the default CBL method falls outside the range of acceptable accuracy.⁸⁶ For the variable portion of load, PJM and the Economic Load Response participant will develop an alternative CBL method, as currently allowed by the market

⁸² *Id.* at 10 (emphasis added).

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ See KEMA Report at 39:

The attribute given the most emphasis in the analysis was accuracy, or how closely a baseline method predicts customers’ actual loads in the sample. The statistic chosen to measure accuracy was the median of the relative root mean squared error (RRMSE). This statistic expresses the baseline’s average hourly accuracy as a fraction of average hourly load for the typical customer.

⁸⁶ The KEMA Report used ten percent hourly error as the limit of an acceptable average error. For the distinct purpose of defining the outer limit of an acceptable accuracy range for an individual load reduction resource, PJM adopts a standard of twenty percent hourly error.

rules, with the key difference that the adopted alternative must be shown to produce results within the accepted range of accuracy as measured by the relative root mean square error test.

In short, PJM and market participants will no longer simply adopt rules that they *hope* will be accurate. They will adopt rules only if they are *shown* to be accurate. KEMA has found that the default method generally is accurate, but market participants can adopt that method only to the extent that it is empirically demonstrated to be accurate for their loads. To the extent it is not acceptably accurate, they must adopt an alternative that is demonstrated to be accurate for the remaining portion of their loads.

The default CBL method that KEMA found optimal for PJM is the “highest four out of five” plus an additive adjustment. KEMA found that the results without the additive adjustment were not as accurate as those with the adjustment. This new default generally corresponds to PJM’s existing CBL method, except that it mandates the additive adjustment (rather than leaving it simply optional, as under the current rules). The new CBL method also discards the current weather-sensitive adjustments, which KEMA found empirically degraded performance on all three tested attributes. Accordingly, PJM is removing the weather-sensitive adjustments from the CBL rules.

PJM also is removing the current CBL rule that offers a possible 15-day extension of the current 45-day “look-back” period. As noted above, PJM’s basic CBL rule (for weekdays) uses the average of the four highest of the five most recent days that meet certain specified criteria. To find those days, PJM “looks back” over the 45 calendar days preceding the load reduction event. Under certain specified circumstances, PJM will extend that look-back period by up to an additional 15 days.

The farther back that period extends, however, the less likely that it accurately reflects current consumption levels or patterns. The possibility of a 15-day extension, therefore, increases the possibility of less accurate CBL calculations. Moreover, the 15-day extension is very rarely used. For example, in its empirical review of two years of recent load reduction data, the KEMA Report found that the 45-day limit was never reached, so they ignored it. PJM staff’s perception is that extensions have been applied at most a handful of times during the period this rule has been in effect. Accordingly, removing it will remove a potential source of inaccuracy while not adversely affecting any market participants.

In addition, PJM is modifying the Economic Load Response Participant review process to provide that a participant’s registration will be reviewed if its actual loads frequently deviate from its scheduled quantities (as determined for purposes of assessing balancing Operating Reserve charges).⁸⁷ Reviewing the registration for those participants that frequently deviate from their schedule reduction quantities permits PJM and those

⁸⁷

See Operating Agreement, Schedule 1, section 3.3A.8(a)(iv).

participants to evaluate any problems and reduce the likelihood of the future assessments of balancing Operating Reserve charges. PJM also is removing the provision in the review process that lists criteria under which PJM may deny a participant's daily settlement, as none of these criteria are applicable under Order No. 745's full LMP compensation scheme (e.g., settlement for uneconomic hours).

PJM also is amending the examples of prohibited settlements set forth in section 3.3A.7(b) to include settlements that do not include all hours that PJM dispatched load reduction or the hours the load reduction cleared in the Day-ahead market. Because only demand reductions that are dispatched by PJM can be compensated by the PJM market, PJM is removing from the examples of prohibited settlements the qualification that compensates settlements based on demand reductions that are the result of operational changes if such demand reductions alleviate congestion.

Lastly, PJM is correcting an apparent error in the description of the basic CBL rule for weekdays. The rule states that PJM will base CBL on the average of the four highest load days of the five "most recent highest" weekdays that meet the specified criteria. The second reference to "highest" is confusing and appears to have been inserted erroneously. The rule does not state how to weight "most recent" versus "highest" in selecting the five days; the parallel rule for weekend days only refers to the highest two days of the most recent three days that meet the criteria (it does not refer to the "most recent highest" three days); and PJM has consistently applied the rule as meaning only the most recent five weekdays that meet the other specified criteria. Accordingly, to eliminate any ambiguity or confusion, PJM is removing the second reference to "highest" in that clause.

III. EFFECTIVE DATE

PJM proposes an effective date for the enclosed Operating Agreement and Tariff revisions as of the first day of a calendar month that is at least 90 days after the date the Commission issues an order addressing this filing. Order No. 745 already recognizes that the new demand response compensation arrangements should not become effective until after the Commission acts on the compliance filings.⁸⁸ That prospective approach is especially prudent in this case. The increased compensation level, coupled with the dispatch requirement, strongly suggests that PJM could see a substantial increase in the level of demand response dispatched on its system. PJM will need to modify its information and dispatch systems to ensure it has the capability in place to accommodate those possible increased demand response levels and provide an efficient mechanism by which Economic Load Response providers can receive and respond to PJM dispatch signals, before the new rules take effect. Further, compliance with Order No. 745 requires that PJM change its settlements and cost allocation mechanisms for Economic Load Response, and, PJM cannot complete the design of those system changes until the

⁸⁸ Order No. 745 at P 6.

Commission has acted on this filing, given that the Commission's order could modify the rules proposed in this filing, and those changes could affect the implementation details. In addition, given the monthly application of the proposed Net Benefits Test, these market rule changes should be implemented at the beginning of a calendar month. Accordingly, to ensure a smooth start-up for these compliance changes to the market rules, PJM proposes that its compliance with Order No. 745 take effect on the first day of a calendar month that is at least 90 days after the date the order is issued on this filing.⁸⁹

IV. CORRESPONDENCE

The following individuals are designated for inclusion on the official service list in this proceeding and for receipt of any communications regarding this filing:

Craig Glazer
Vice President–Federal Government Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 423-4743 (phone)
(202) 393-7741 (fax)
glazec@pjm.com

Barry S. Spector
Paul M. Flynn
Ryan J. Collins
Wright & Talisman, P.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 393-1200 (phone)
(202) 393-1240 (fax)
spector@wrightlaw.com
flynn@wrightlaw.com
collins@wrightlaw.com

Jeanine Schleiden
Senior Counsel
PJM Interconnection, L.L.C.
955 Jefferson Avenue
Norristown, PA 19403
(610) 666-4438 (phone)
(610) 666-4281 (fax)
schlej@pjm.com

⁸⁹ As this date is uncertain, PJM is including a placeholder effective date of 12/31/9998 in the metadata of the submitted eTariff sheets. PJM requests, and hereby consents to, the Commission in its order on this filing replacing this date with the actual effective date that is the first day of a calendar month that is at least 90 days after the date of such order.

V. DOCUMENTS ENCLOSED

This filing consists of the following:

1. This transmittal letter;
2. As required by Order No. 745,⁹⁰ Attachments A, B, and C to this filing include data, analytical methods, and supply curves used to determine the monthly threshold prices for the most recent 12 months;
3. Revisions to Attachment K of the PJM Tariff (in non-redlined and redlined format (as Attachments D and E, respectively) and in electronic tariff filing format as required by Order No. 714); and
4. Revisions to the Schedule 1 of the PJM Operating Agreement (in non-redlined and redlined format (as Attachments F and G, respectively) and in electronic tariff filing format as required by Order No. 714).

VI. SERVICE

PJM has served a copy of this filing on all PJM members and on all state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance with the Commission's regulations,⁹¹ PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: <http://www.pjm.com/documents/ferc-manuals/ferc-filings.aspx> with a specific link to the newly-filed document, and will send an e-mail on the same date as this filing to all PJM members and all state utility regulatory commissions in the PJM Region⁹² alerting them that this filing has been made by PJM and is available by following such link. PJM also serves the parties listed on the Commission's official service list for this docket. If the document is not immediately available by using the referenced link, the document will be available through the referenced link within 24 hours of the filing. Also, a copy of this filing will be available on the FERC's eLibrary website located at the following link: <http://www.ferc.gov/docs-filing/elibrary.asp> in accordance with the Commission's regulations and Order No. 714.

⁹⁰ Order No. 745 at P 81.

⁹¹ See 18 C.F.R. §§ 35.2(e) and 385.2010(f)(3).

⁹² PJM already maintains, updates and regularly uses e-mail lists for all PJM members and affected state commissions.

VII. CONCLUSION

Accordingly, PJM requests that the Commission accept the enclosed Tariff and Operating Agreement revisions, effective 90 days after the date of the Commission order, and find that PJM is in compliance with Order No. 745.

Respectfully submitted,

Craig Glazer
Vice President–Federal Government Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 423-4743 (phone)
(202) 393-7741 (fax)
glazec@pjm.com

/s/ Paul M. Flynn
Barry S. Spector
Paul M. Flynn
Ryan J. Collins
Wright & Talisman, P.C.
1200 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 393-1200 (phone)
(202) 393-1240 (fax)
spector@wrightlaw.com
flynn@wrightlaw.com
collins@wrightlaw.com

Jeanine Schleiden
Senior Counsel
PJM Interconnection, L.L.C.
955 Jefferson Avenue
Norristown, PA 19403
(610) 666-4438 (phone)
(610) 666-4281 (fax)
schlej@pjm.com

July 22, 2011

ATTACHMENT A

Monthly Supply Curves, Fuel Price Factors, And Equations For Latest 12 Months

Net Benefits Test Results

Introduction

The following document contains details on the twelve months of Net Benefit Test results required by the Commission to be submitted with PJM's compliance filing for Order 745.

Test Result Summary

The table below shows the results of the text execution. Test results were run as if the test were run on the 15th of the prior month (i.e. futures prices at the time were utilized).

Month	Net Benefits Point
August, 2010	\$35.57
September, 2010	\$34.07
October, 2010	\$38.10
November, 2010	\$36.83
December, 2010	\$37.04
January, 2011	\$40.27
February, 2011	\$40.49
March, 2011	\$38.48
April, 2011	\$36.76
May, 2011	\$34.68
June, 2011	\$35.09
July, 2011	\$36.78

Net Benefits Test Results

August, 2010 Results

August 2010 Test Results	Net Benefits Point
Net Benefits Result	\$35.57
Gas Price Ratio	1.460454546
Oil Price Ratio	1.075108178
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	3.33126729
Equation Parameter <i>b</i>	0.000128005
Equation Parameter <i>c</i>	14.31261958
Equation Parameter <i>d</i>	33.5817654

Smoothed Supply Curve Equation:

$$LMP = 3.33126729^{(0.000128005 * mw - 14.31261958)} + 33.5817654$$

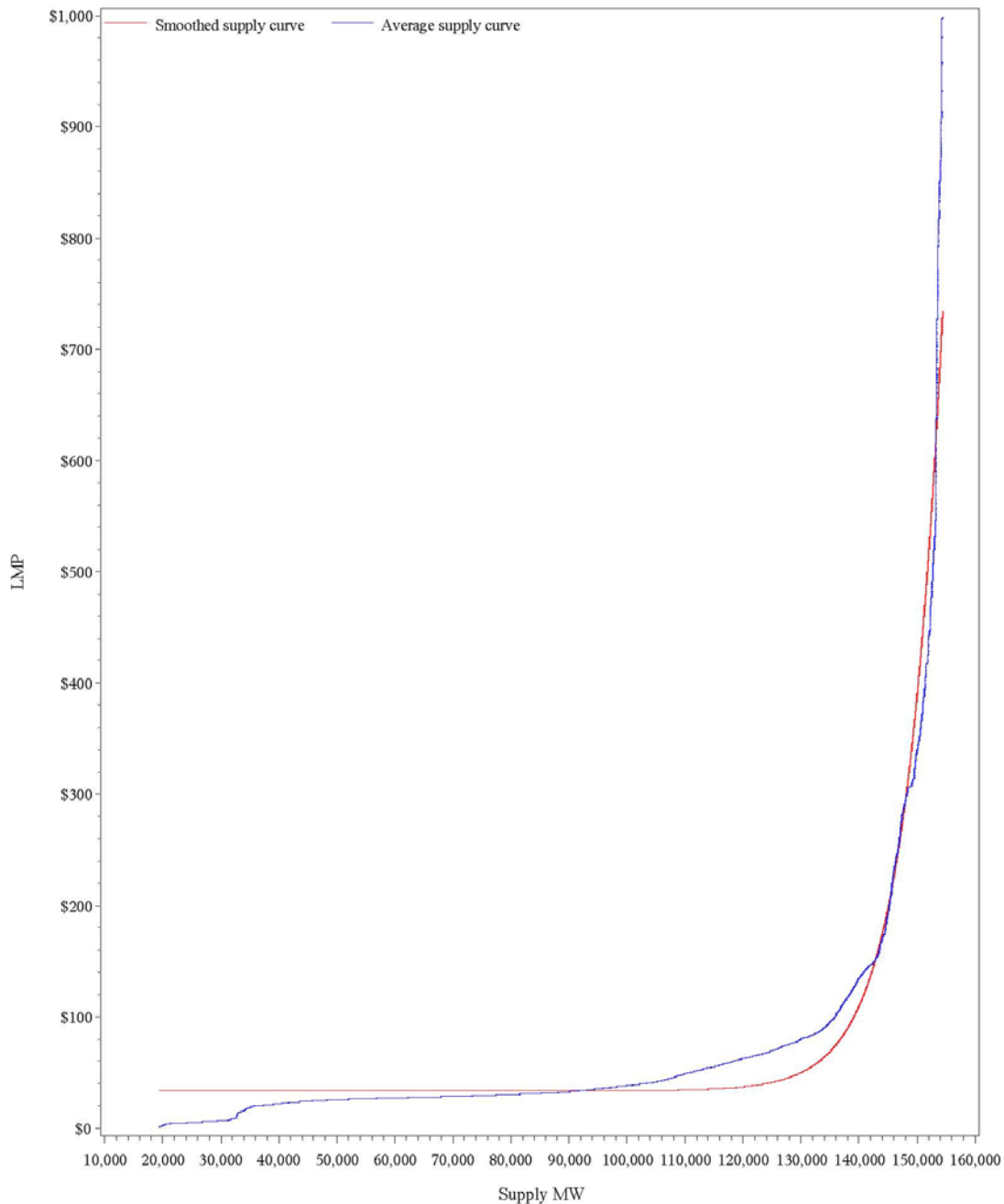
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(3.33126729) * 0.000128005 * 3.33126729^{(0.000128005 * mw - 14.31261958)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

13:03 Monday, July 18, 2011 1

Supply Curve and Modeled Supply Curve - August 2010



$$\text{LMP} = 3.331267 ** (0.000128 * \text{MW} - 14.31262) + 33.58177$$

Net Benefits Test Results

September, 2010 Results

September 2010 Test Results	Net Benefits Point
Net Benefits Result	\$34.07
Gas Price Ratio	1.463084981
Oil Price Ratio	1.131105214
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.765898743
Equation Parameter <i>b</i>	0.000137465
Equation Parameter <i>c</i>	14.08893109
Equation Parameter <i>d</i>	31.82132165

Smoothed Supply Curve Equation:

$$LMP = 2.765898743^{(0.000137465 * mw - 14.08893109)} + 31.82132165$$

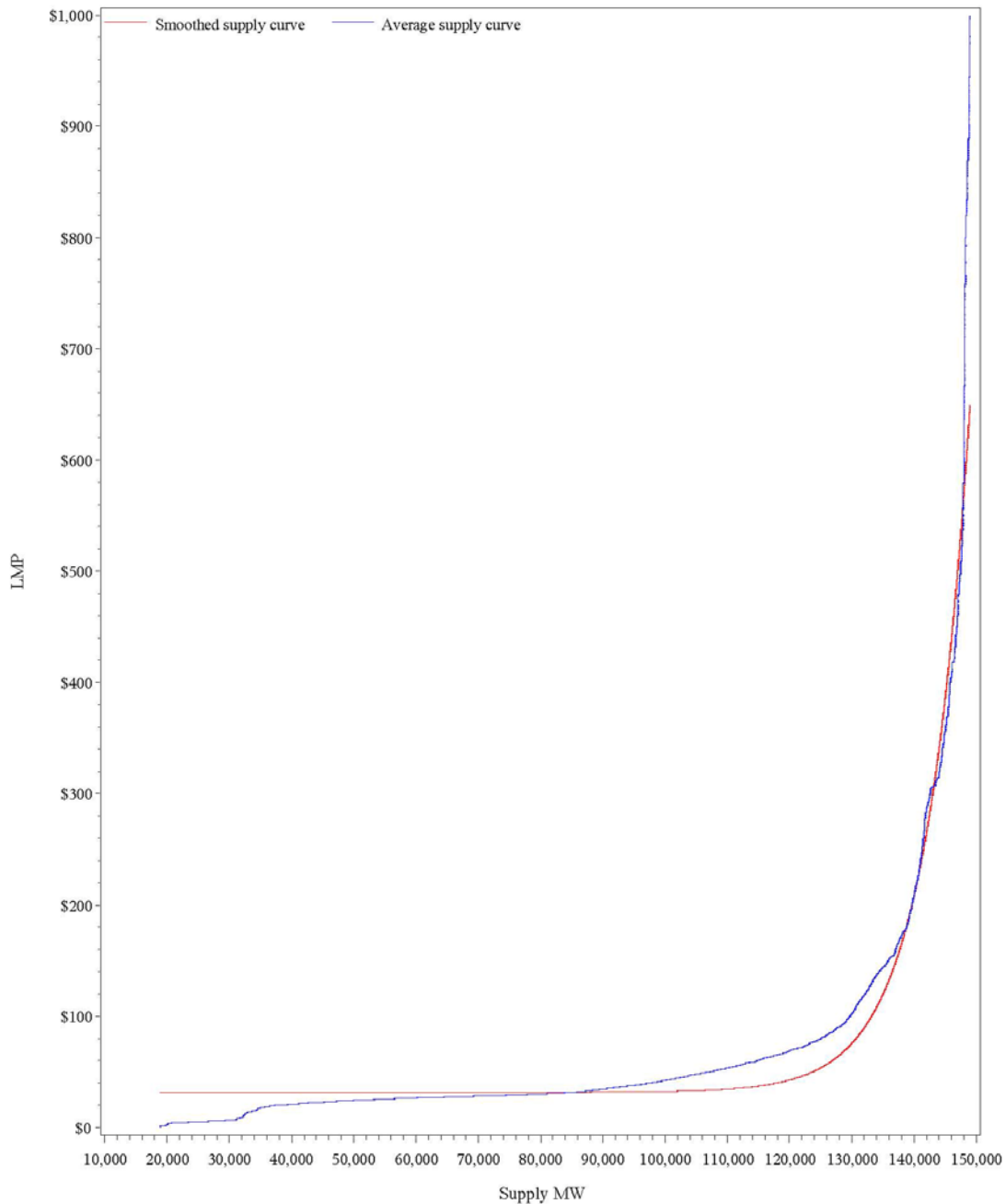
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.765898743) * 0.000137465 * 2.765898743^{(0.000137465 * mw - 14.08893109)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

13:03 Monday, July 18, 2011 1

Supply Curve and Modeled Supply Curve - September 2010



$$\text{LMP} = 2.765899 ** (0.000137 * \text{MW} - 14.08893) + 31.82132$$

Net Benefits Test Results

October, 2010 Results

October 2010 Test Results	Net Benefits Point
Net Benefits Result	\$38.10
Gas Price Ratio	0.998978318
Oil Price Ratio	1.079290369
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	3.371231033
Equation Parameter <i>b</i>	0.000160362
Equation Parameter <i>c</i>	17.48919817
Equation Parameter <i>d</i>	36.34845615

Smoothed Supply Curve Equation:

$$LMP = 3.371231033^{(0.000160362 * mw - 17.48919817)} + 36.34845615$$

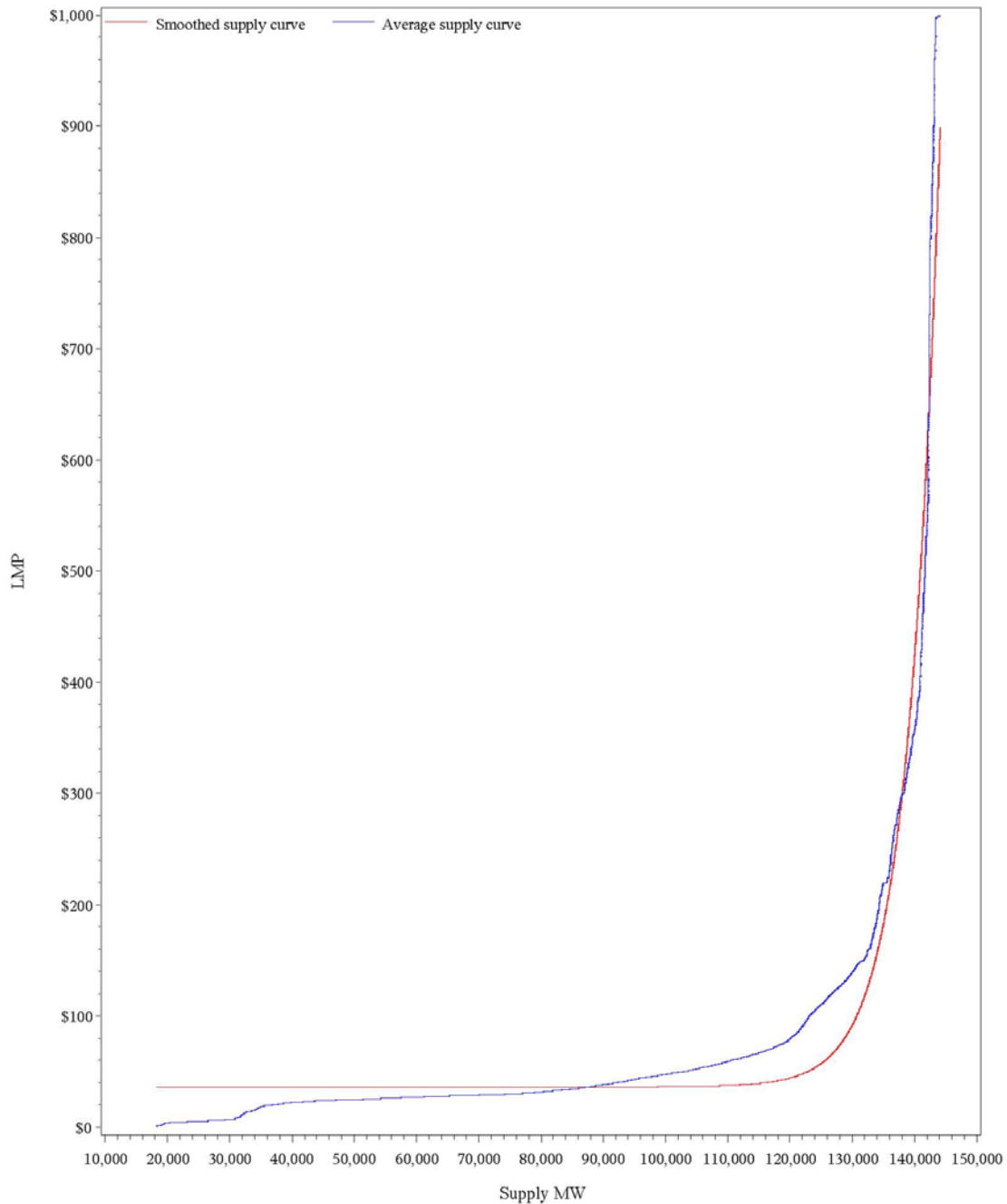
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(3.371231033) * 0.000160362 * 3.371231033^{(0.000160362 * mw - 17.48919817)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - October 2010



$$\text{LMP} = 3.371231 \cdot (0.00016 \cdot \text{MW} - 17.4892) + 36.34846$$

Net Benefits Test Results

November, 2010 Results

November 2010 Test Results	Net Benefits Point
Net Benefits Result	\$36.83
Gas Price Ratio	0.96154396
Oil Price Ratio	1.115891503
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	3.257449714
Equation Parameter <i>b</i>	0.000155116
Equation Parameter <i>c</i>	17.1492179
Equation Parameter <i>d</i>	35.06092602

Smoothed Supply Curve Equation:

$$LMP = 3.257449714^{(0.000155116 * mw - 17.1492179)} + 35.06092602$$

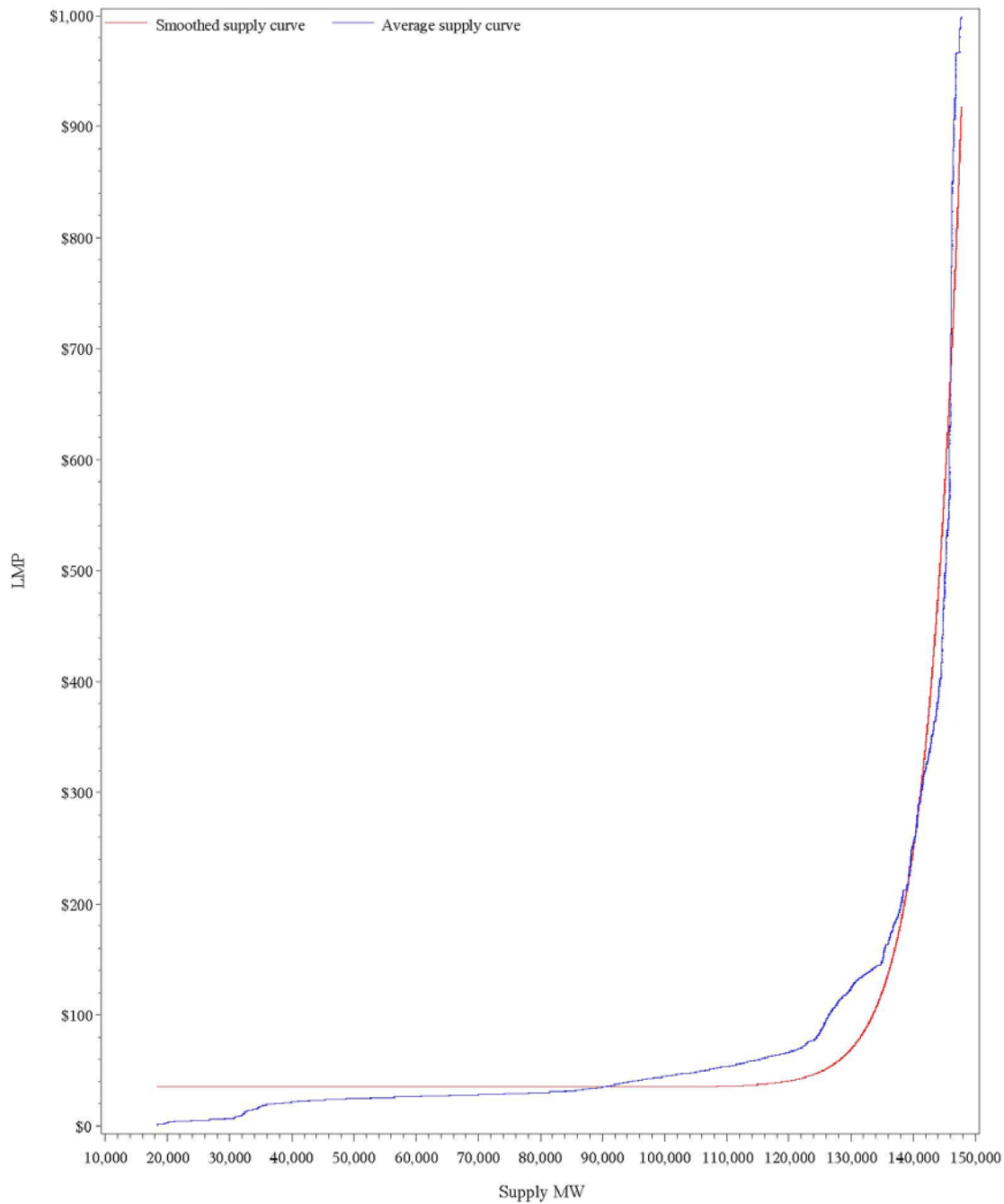
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(3.257449714) * 0.000155116 * 3.257449714^{(0.000155116 * mw - 17.1492179)} * \frac{LMP}{mw}}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - November 2010



$$LMP = 3.25745 ** (0.000155 * MW - 17.14922) + 35.06093$$

Net Benefits Test Results

December, 2010 Results

December 2010 Test Results	Net Benefits Point
Net Benefits Result	\$37.04
Gas Price Ratio	0.719381689
Oil Price Ratio	1.180646556
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	3.191085903
Equation Parameter <i>b</i>	0.000142238
Equation Parameter <i>c</i>	16.38377005
Equation Parameter <i>d</i>	35.15798882

Smoothed Supply Curve Equation:

$$LMP = 3.191085903^{(0.000142238 * mw - 16.38377005)} + 35.15798882$$

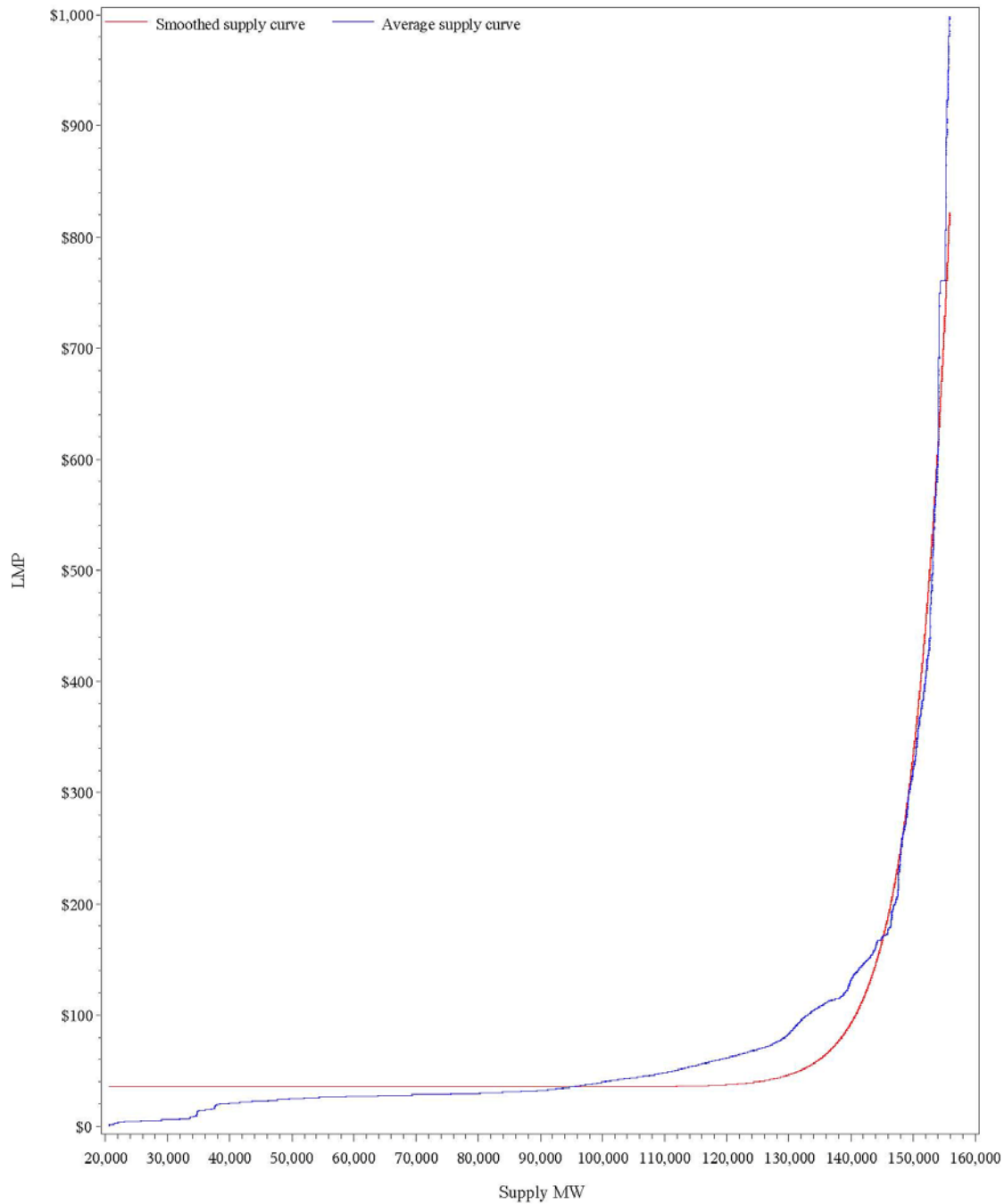
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(3.191085903) * 0.000142238 * 3.191085903^{(0.000142238 * mw - 16.38377005)}} * \frac{lmp}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - December 2010



$$LMP = 3.191086 ** (0.000142 * MW - 16.38377) + 35.15799$$

Net Benefits Test Results

January, 2011 Results

January 2011 Test Results	Net Benefits Point
Net Benefits Result	\$40.27
Gas Price Ratio	0.723842196
Oil Price Ratio	1.194510591
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.419801034
Equation Parameter <i>b</i>	0.000153878
Equation Parameter <i>c</i>	16.85671061
Equation Parameter <i>d</i>	37.72883012

Smoothed Supply Curve Equation:

$$LMP = 2.419801034^{(0.000153878 * mw - 16.85671061)} + 37.72883012$$

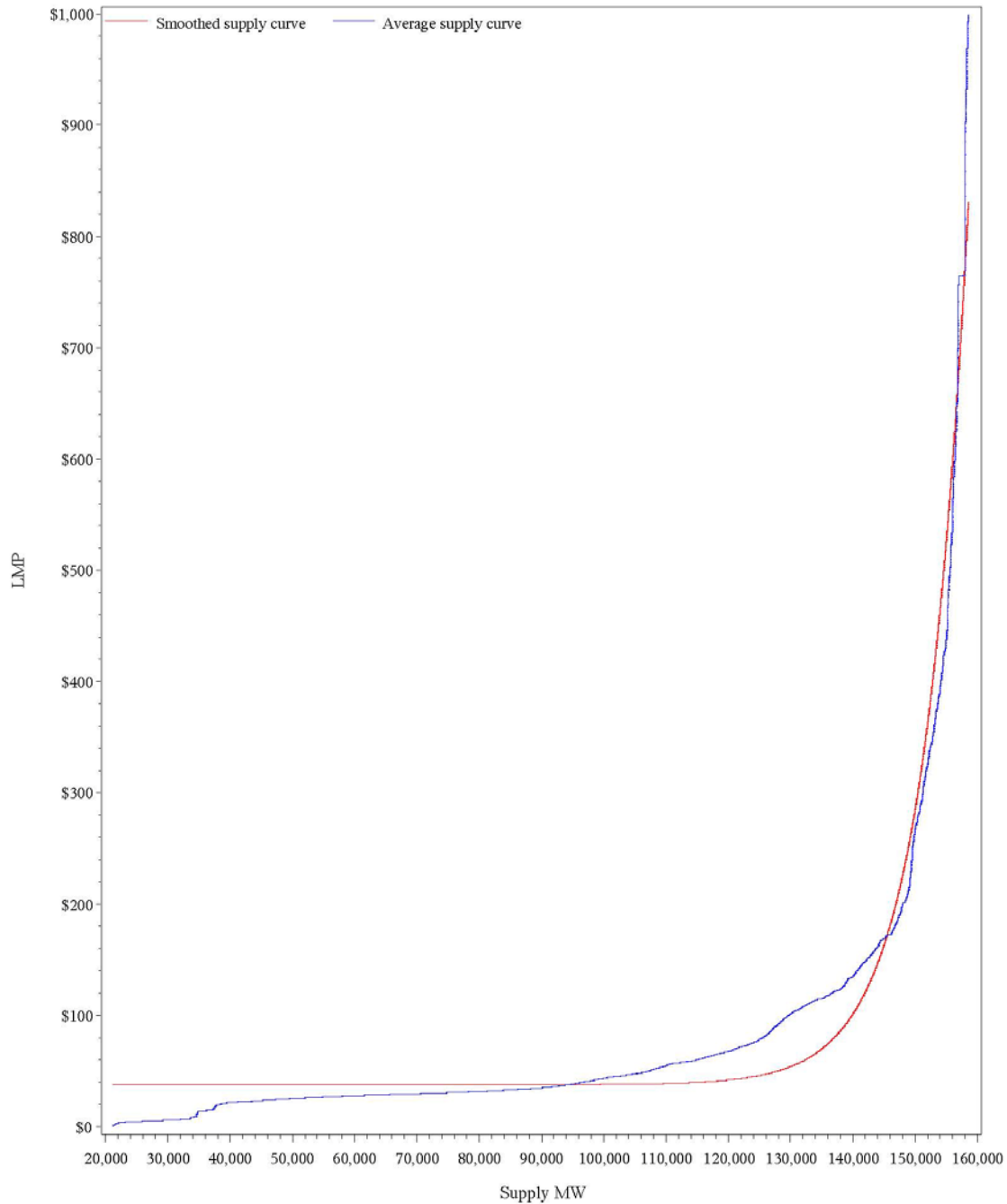
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.419801034) * 0.000153878 * 2.419801034^{(0.000153878 * mw - 16.85671061)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - January 2011



$$LMP = 2.419801 ** (0.000154 * MW - 16.85671) + 37.72883$$

Net Benefits Test Results

February, 2011 Results

February 2011 Test Results	Net Benefits Point
Net Benefits Result	\$40.49
Gas Price Ratio	0.841855405
Oil Price Ratio	1.325128257
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.237450411
Equation Parameter <i>b</i>	0.000160854
Equation Parameter <i>c</i>	16.81927066
Equation Parameter <i>d</i>	37.71088706

Smoothed Supply Curve Equation:

$$LMP = 2.237450411^{(0.000160854 * mw - 16.81927066)} + 37.71088706$$

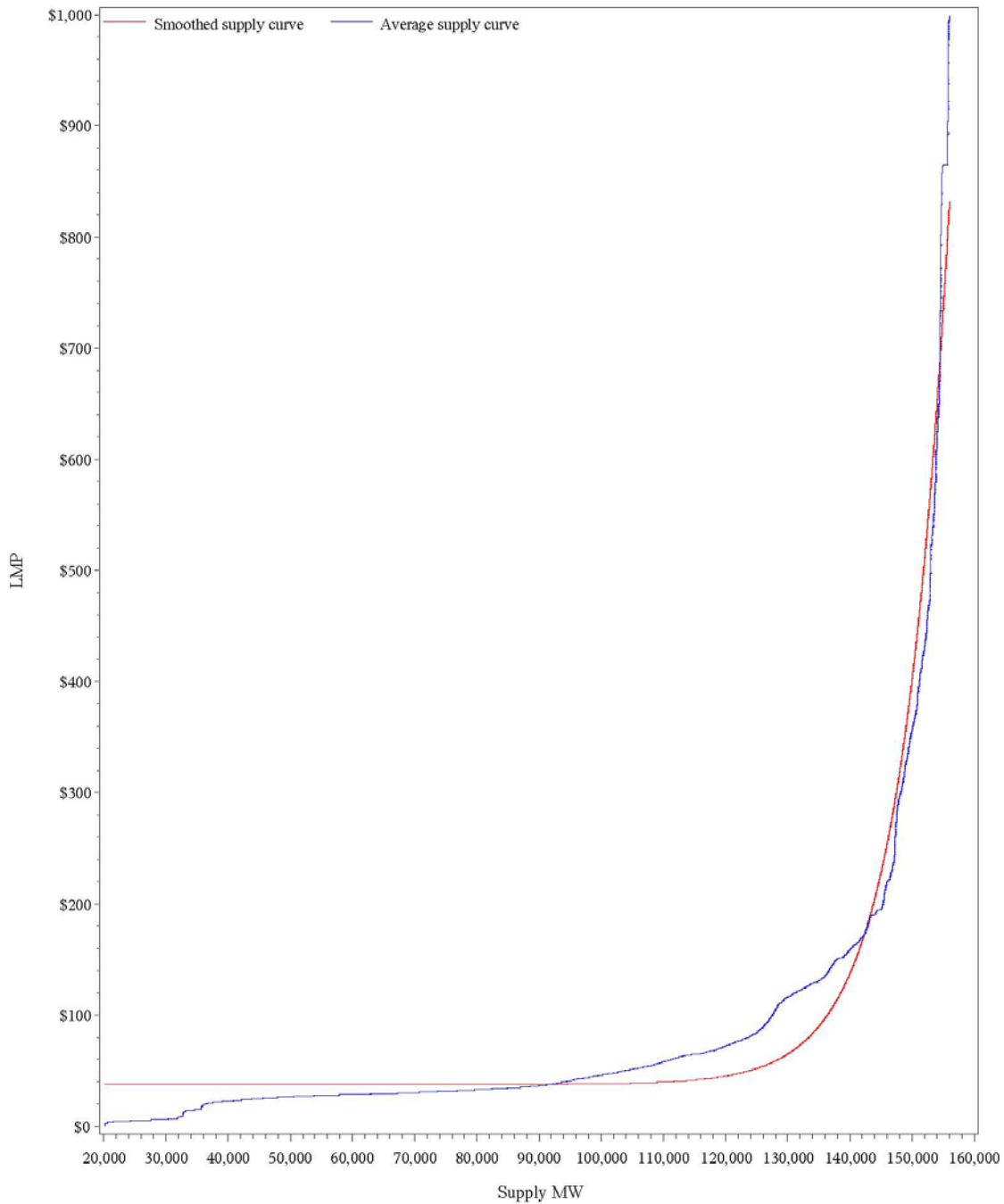
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.237450411) * 0.000160854 * 2.237450411^{(0.000160854 * mw - 16.81927066)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - February 2011



$$LMP = 2.23745 ** (0.000161 * MW - 16.81927) + 37.71089$$

Net Benefits Test Results

March, 2011 Results

March 2011 Test Results	Net Benefits Point
Net Benefits Result	\$38.48
Gas Price Ratio	0.927081223
Oil Price Ratio	1.306849988
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.365341753
Equation Parameter <i>b</i>	0.000164244
Equation Parameter <i>c</i>	16.91658691
Equation Parameter <i>d</i>	35.99246498

Smoothed Supply Curve Equation:

$$LMP = 2.365341753^{(0.000164244 * mw - 16.91658691)} + 35.99246498$$

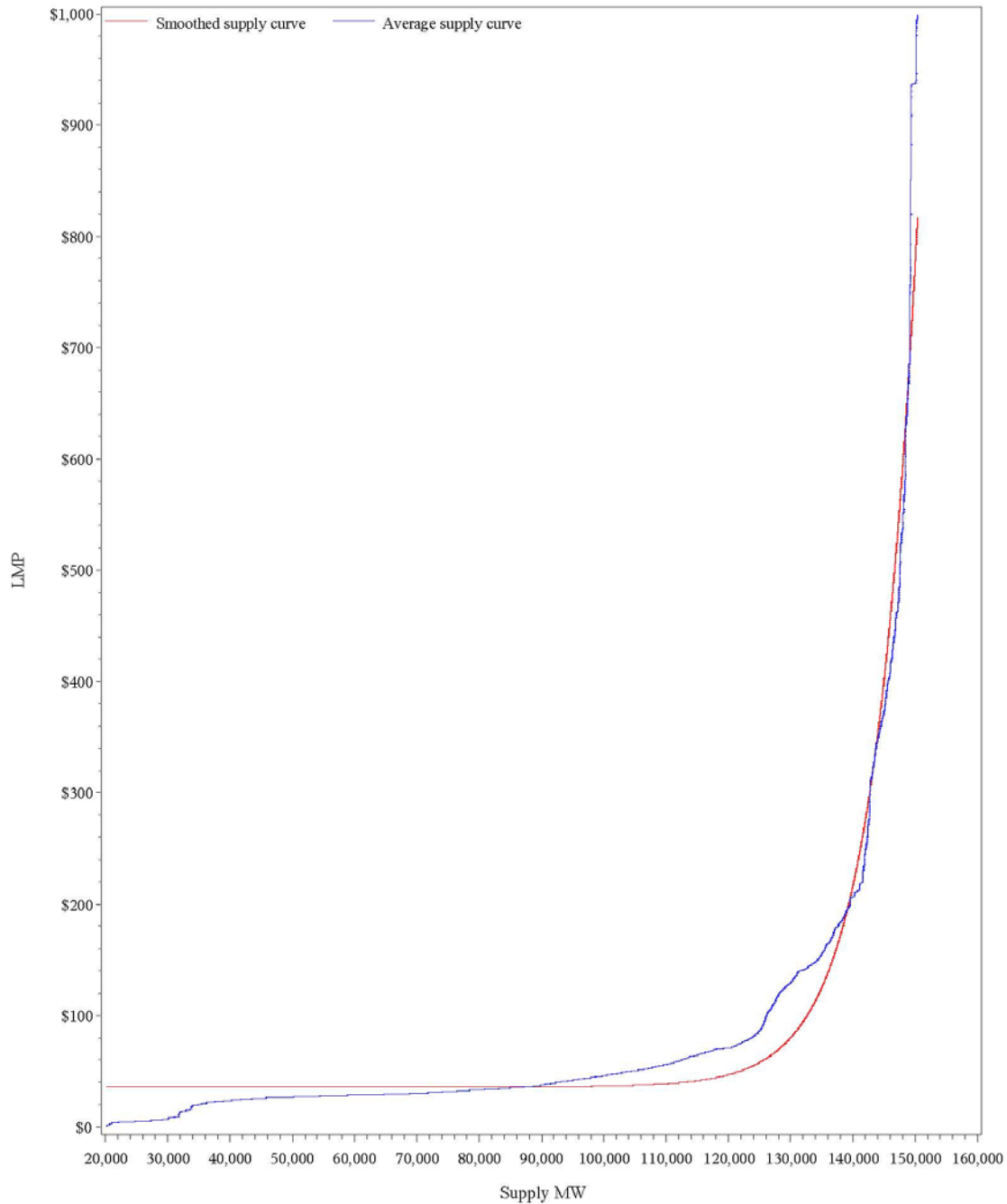
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.365341753) * 0.000164244 * 2.365341753^{(0.000164244 * mw - 16.91658691)}} * \frac{lmp}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - March 2011



$$LMP = 2.365342 ** (0.000164 * MW - 16.91659) + 35.99246$$

Net Benefits Test Results

April, 2011 Results

April 2011 Test Results	Net Benefits Point
Net Benefits Result	\$36.76
Gas Price Ratio	0.976398395
Oil Price Ratio	1.362494508
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.240109638
Equation Parameter <i>b</i>	0.000183111
Equation Parameter <i>c</i>	17.5388862
Equation Parameter <i>d</i>	34.31118406

Smoothed Supply Curve Equation:

$$LMP = 2.240109638^{(0.000183111 * mw - 17.5388862)} + 34.31118406$$

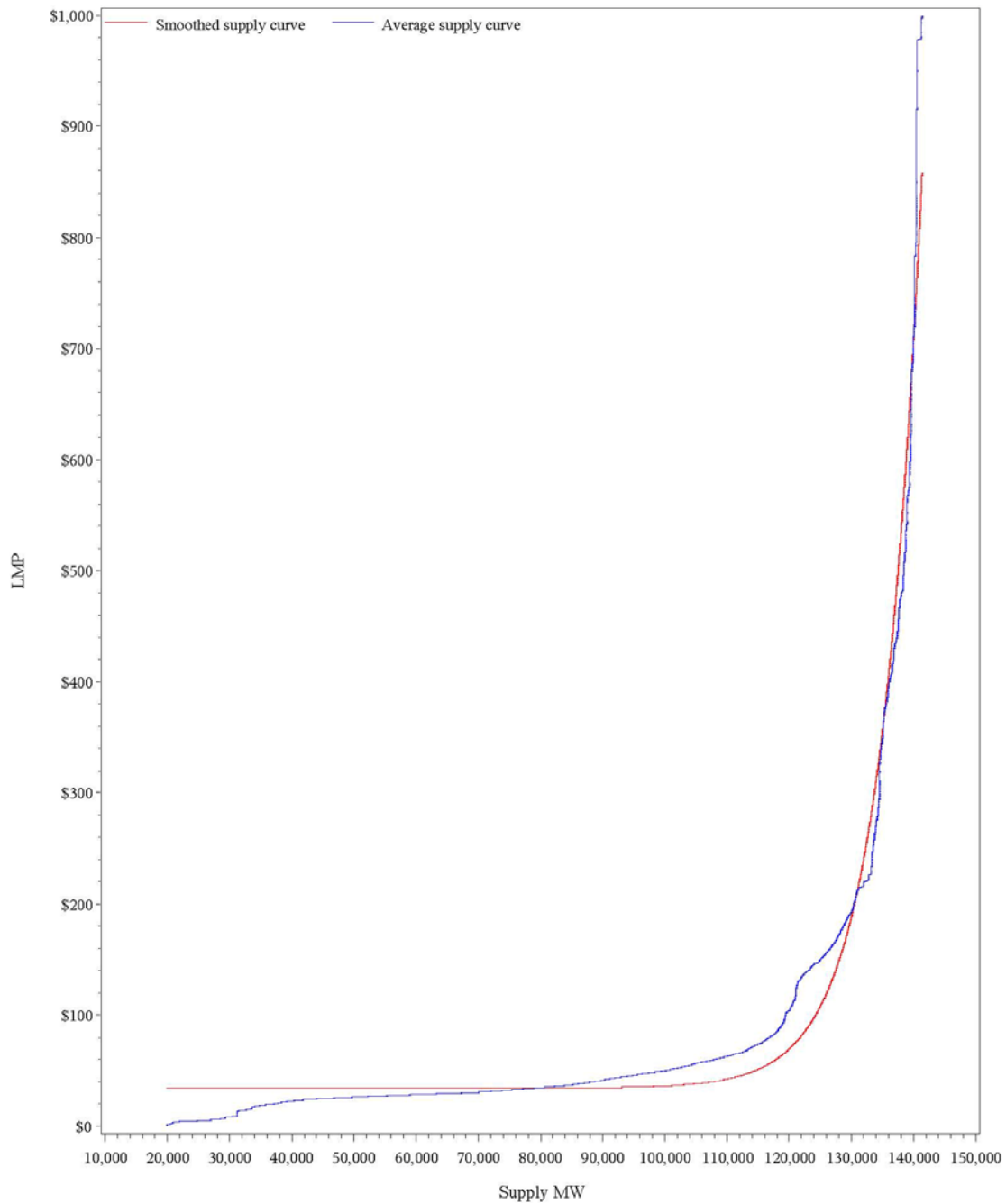
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.240109638) * 0.000183111 * 2.240109638^{(0.000183111 * mw - 17.5388862)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - April 2011



$$LMP = 2.24011 ** (0.000183 * MW - 17.53889) + 34.31118$$

Net Benefits Test Results

May, 2011 Results

May 2011 Test Results	Net Benefits Point
Net Benefits Result	\$34.68
Gas Price Ratio	1.014002897
Oil Price Ratio	1.537404445
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.195104289
Equation Parameter <i>b</i>	0.000170655
Equation Parameter <i>c</i>	15.8023762
Equation Parameter <i>d</i>	32.08524423

Smoothed Supply Curve Equation:

$$LMP = 2.195104289^{(0.000170655 * mw - 15.8023762)} + 32.08524423$$

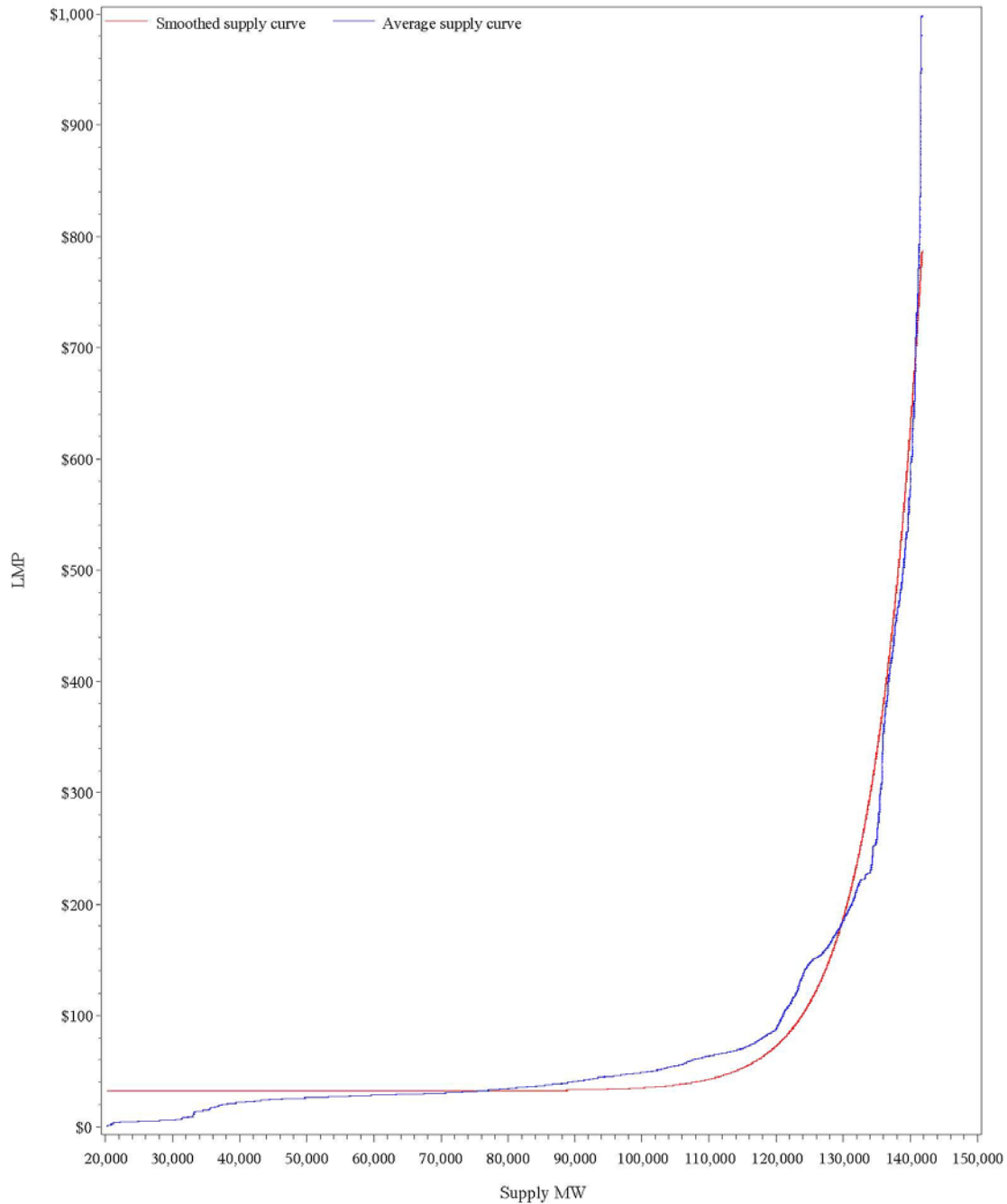
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.195104289) * 0.000170655 * 2.195104289^{(0.000170655 * mw - 15.8023762)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

13:03 Monday, July 18, 2011 1

Supply Curve and Modeled Supply Curve - May 2011



$$LMP = 2.195104 ** (0.000171 * MW - 15.80238) + 32.08524$$

Net Benefits Test Results

June, 2011 Results

June 2011 Test Results	Net Benefits Point
Net Benefits Result	\$35.09
Gas Price Ratio	0.884662693
Oil Price Ratio	1.427114373
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	2.810288551
Equation Parameter <i>b</i>	0.000146875
Equation Parameter <i>c</i>	15.86241879
Equation Parameter <i>d</i>	33.04103809

Smoothed Supply Curve Equation:

$$LMP = 2.810288551^{(0.000146875 * mw - 15.86241879)} + 33.04103809$$

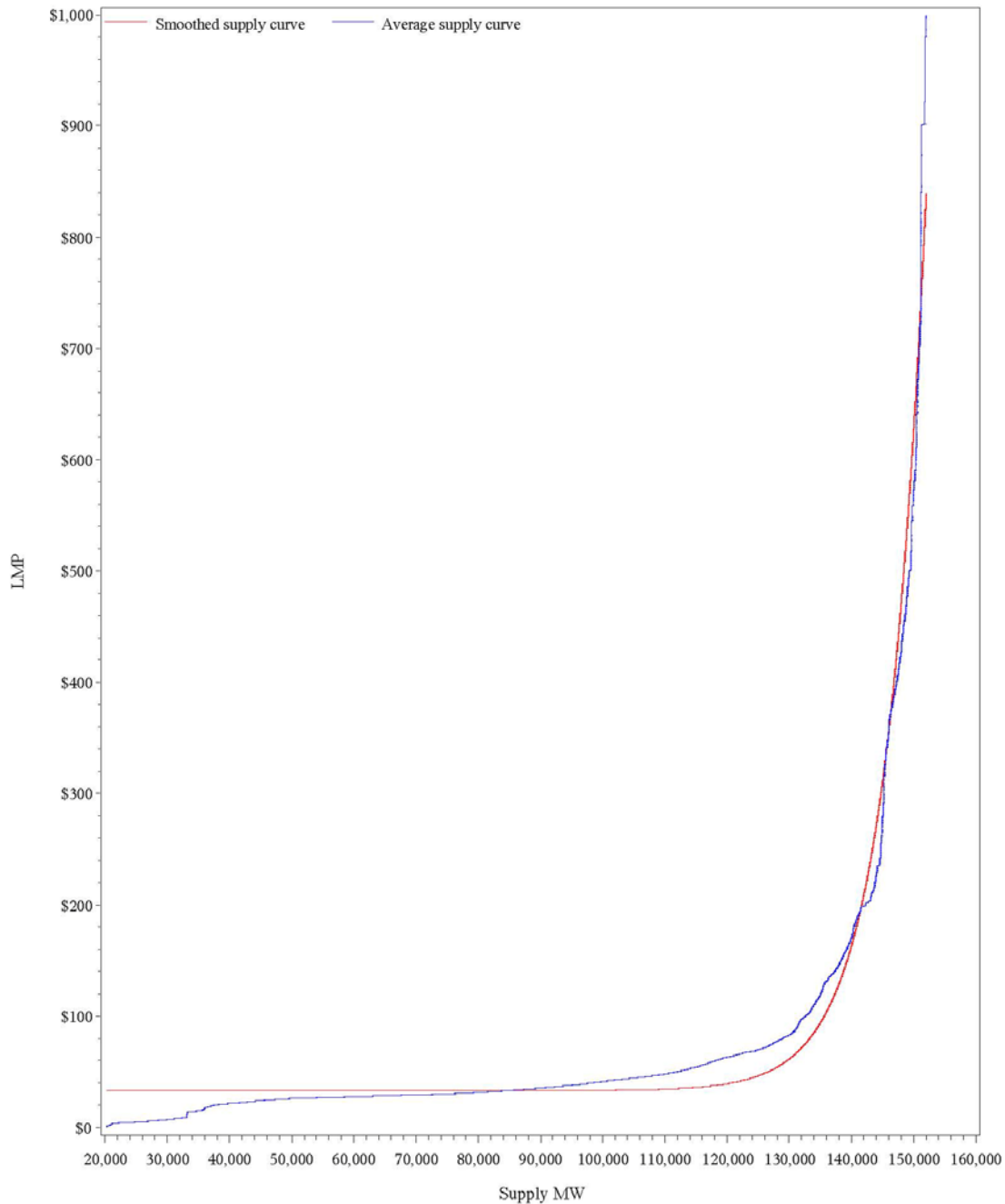
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(2.810288551) * 0.000146875 * 2.810288551^{(0.000146875 * mw - 15.86241879)}} * \frac{LMP}{mw}$$

Net Benefits Test Results

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Supply Curve and Modeled Supply Curve - June 2011



$$\text{LMP} = 2.810289 ** (0.000147 * \text{MW} - 15.86242) + 33.04104$$

Net Benefits Test Results

July, 2011 Results

July 2011 Test Results	Net Benefits Point
Net Benefits Result	\$36.78
Gas Price Ratio	0.989607984
Oil Price Ratio	1.542233797
Coal Price Ratio	1.136980925
Equation Parameter <i>a</i>	3.020989738
Equation Parameter <i>b</i>	0.000146513
Equation Parameter <i>c</i>	16.58660469
Equation Parameter <i>d</i>	34.8393663

Smoothed Supply Curve Equation:

$$LMP = 3.020989738^{(0.000146513 * mw - 16.58660469)} + 34.8393663$$

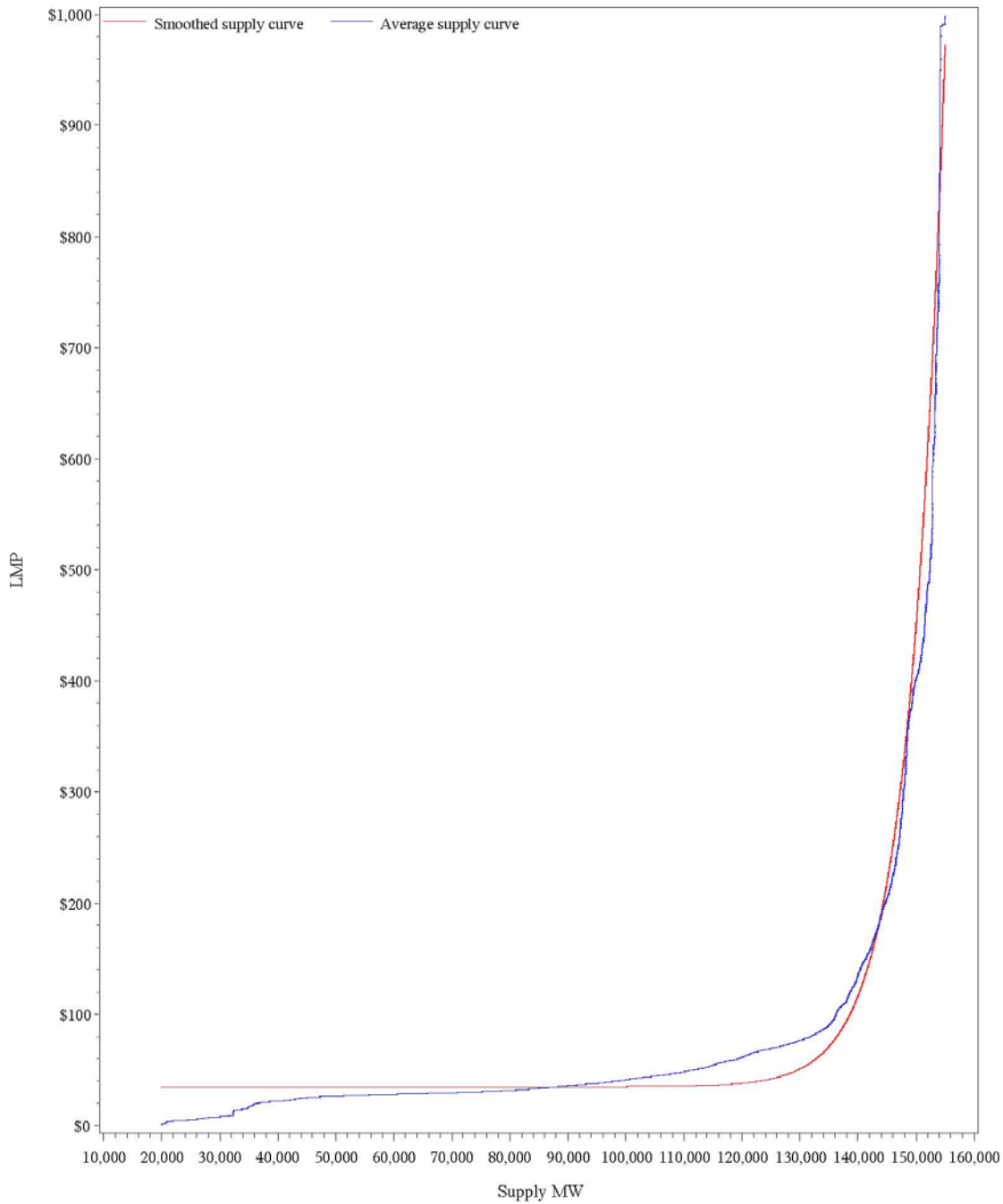
Elasticity Equation:

$$Elasticity = \frac{1}{\log_e(3.020989738) * 0.000146513 * 3.020989738^{(0.000146513 * mw - 16.58660469)}} * \frac{lmp}{mw}$$

Net Benefits Test Results

13:03 Monday, July 18, 2011 1

Supply Curve and Modeled Supply Curve - July 2011



$$\text{LMP} = 3.02099 ** (0.000147 * \text{MW} - 16.5866) + 34.83937$$

ATTACHMENT B

Supply Curve Data

This document will describe the data posted with the net benefits test results.

The Net Benefit Tab:

This tab contains the date for which the test was run and the net benefits test result. This is the price above which demand response resources are compensated full LMP per the PJM Tariff, Operating Agreement, and Manuals.

Fuel Ratios Tab:

This tab contains the fuel adjustment ratios that were determined by comparing the historical spot prices to the futures prices for the indicated fuels.

For initial implementation, the gas ratio is determined by comparison of the Henry Hub gas price. The oil price ratio is determined by comparison of the No. 2 oil price at New York Harbor. The coal ratio is determined by comparing the prices on a mix of coals commonly used in the PJM area.

Curve Parameters Tab:

This tab contains the equation parameters that were determined by the partial-least-squares equation fit.

Supply Curve Tab

This tab contains the average supply curve results for the month for which the test was run as well as the results of the equation-fit curve.

Year: The year for which the test was run

Month: The month for which the test was run

LMP: the LMP value

Total_gen_mw: the total amount of generation MW available at that LMP value

Smoothed_curve_value: The results of using the supply curve equation at the indicated LMP value.

August 2010

Net Benefit Tab

Effective_month	Test_result
8/1/2010 0:00	\$35.57

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	1.460454546	1.075108178

Curve Parameters Tab

a	b	c	d
3.33126729	0.000128005	14.31261958	33.5817654

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	1	19420.77419	33.58177
2010	8	2	20006.80645	33.58177
2010	8	3	20007.35484	33.58177
2010	8	4	21222.83871	33.58177
2010	8	5	24787.22581	33.58177
2010	8	6	28503.87097	33.58177
2010	8	7	31234.25806	33.58177
2010	8	8	31820.51613	33.58177
2010	8	9	32670.54839	33.58178
2010	8	10	32677.90323	33.58178
2010	8	11	32678.22581	33.58178
2010	8	12	32788.77419	33.58178
2010	8	13	32871.3871	33.58178
2010	8	14	32885.93548	33.58178
2010	8	15	33694.58065	33.58178
2010	8	16	34056.96774	33.58178
2010	8	17	34193.93548	33.58178
2010	8	18	34533.93548	33.58178
2010	8	19	35160.67742	33.58178
2010	8	20	35688.51613	33.58178
2010	8	21	38273.29032	33.58178
2010	8	22	40246.87097	33.58179
2010	8	23	41751.64516	33.58179
2010	8	24	44465.77419	33.5818
2010	8	25	47442.06452	33.58182
2010	8	26	52476.64516	33.58188
2010	8	27	58986	33.58206
2010	8	28	66655.22581	33.58272
2010	8	29	73764.29032	33.58462
2010	8	30	79112	33.58826
2010	8	31	84457.09677	33.59655
2010	8	32	88290.3871	33.60845
2010	8	33	90796.51613	33.62102
2010	8	34	92665	33.63411
2010	8	35	94405.22581	33.6502
2010	8	36	96237.87097	33.67252
2010	8	37	97820.80645	33.69757
2010	8	38	99780.35484	33.73837
2010	8	39	101336.2258	33.78078
2010	8	40	102880.129	33.83421
2010	8	41	104438.0323	33.90267
2010	8	42	105384.5806	33.95304
2010	8	43	106314.6129	34.01022
2010	8	44	106976.6129	34.05621
2010	8	45	107707.3226	34.11273
2010	8	46	108281.6774	34.16185
2010	8	47	108789.1935	34.20901
2010	8	48	109387.5806	34.26957
2010	8	49	110176.6774	34.35846
2010	8	50	110896.2903	34.4495
2010	8	51	111612.3226	34.55068

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	52	112418.3871	34.67877
2010	8	53	113088.0323	34.79796
2010	8	54	113818.6452	34.94282
2010	8	55	114894.9032	35.18823
2010	8	56	115559.5484	35.36141
2010	8	57	116068.5484	35.50655
2010	8	58	116800.129	35.73613
2010	8	59	117672.7419	36.04606
2010	8	60	118215.0968	36.26076
2010	8	61	118802.3871	36.5144
2010	8	62	119562.5161	36.87867
2010	8	63	120543.7097	37.41656
2010	8	64	121334.9032	37.91356
2010	8	65	122008.6129	38.38723
2010	8	66	122639.7419	38.87784
2010	8	67	123675.9677	39.79433
2010	8	68	124260.0968	40.37921
2010	8	69	124685.9355	40.84002
2010	8	70	125313.5806	41.57675
2010	8	71	125856.4516	42.27402
2010	8	72	126274.2903	42.85184
2010	8	73	126507.2903	43.19058
2010	8	74	126963.7097	43.8904
2010	8	75	127680.8387	45.09435
2010	8	76	128060.8065	45.78825
2010	8	77	128873.6452	47.4163
2010	8	78	129356.0323	48.48338
2010	8	79	129704.4839	49.30503
2010	8	80	129901.7419	49.79009
2010	8	81	130457.7742	51.23943
2010	8	82	131087.0323	53.03657
2010	8	83	131633.3548	54.74454
2010	8	84	132048.7419	56.14282
2010	8	85	132352.6452	57.22401
2010	8	86	133017.4516	59.77326
2010	8	87	133189.129	60.47509
2010	8	88	133489.5484	61.74877
2010	8	89	133727.9677	62.80239
2010	8	90	133905.8387	63.61403
2010	8	91	134178.7742	64.9035
2010	8	92	134328.871	65.63607
2010	8	93	134509	66.53787
2010	8	94	134764.6129	67.8613
2010	8	95	134885.3871	68.50496
2010	8	96	135046.3226	69.38148
2010	8	97	135326.0323	70.95756
2010	8	98	135498.6129	71.96443
2010	8	99	135602.9032	72.58597
2010	8	100	135765.5806	73.57565
2010	8	101	135941.3226	74.67305
2010	8	102	136019.9677	75.17384

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	103	136115.6774	75.79154
2010	8	104	136246.5806	76.65125
2010	8	105	136424.1613	77.84557
2010	8	106	136576.6129	78.89727
2010	8	107	136650.8065	79.4181
2010	8	108	136764.6774	80.22914
2010	8	109	136860.6129	80.92356
2010	8	110	137002.6129	81.97043
2010	8	111	137099.8065	82.70029
2010	8	112	137212.4516	83.55996
2010	8	113	137329.2581	84.46729
2010	8	114	137475.6774	85.62794
2010	8	115	137579.8065	86.46944
2010	8	116	137759.6129	87.95466
2010	8	117	137891.9355	89.07423
2010	8	118	138090.9677	90.80179
2010	8	119	138190.2258	91.68333
2010	8	120	138292.4194	92.60513
2010	8	121	138437	93.9343
2010	8	122	138556.1613	95.05226
2010	8	123	138676.4194	96.20151
2010	8	124	138758.2903	96.99617
2010	8	125	138906.5161	98.46065
2010	8	126	139026.6452	99.6723
2010	8	127	139113.7097	100.56458
2010	8	128	139260.0968	102.09205
2010	8	129	139352.4194	103.07325
2010	8	130	139478.1613	104.43228
2010	8	131	139541.1613	105.12315
2010	8	132	139654.3548	106.38141
2010	8	133	139740.2581	107.35107
2010	8	134	139773.5806	107.73068
2010	8	135	140015.1613	110.54177
2010	8	136	140192.2581	112.66998
2010	8	137	140279	113.73375
2010	8	138	140470.5161	116.13338
2010	8	139	140571.7097	117.43017
2010	8	140	140724.5161	119.42709
2010	8	141	140896.6774	121.73398
2010	8	142	140995.3871	123.0845
2010	8	143	141192.3871	125.84197
2010	8	144	141407.4839	128.94986
2010	8	145	141572.7419	131.40857
2010	8	146	141705.6774	133.43232
2010	8	147	142132.1613	140.21183
2010	8	148	142333.7419	143.57456
2010	8	149	142458.4839	145.70838
2010	8	150	142595.871	148.10644
2010	8	151	142662.3871	149.28583
2010	8	152	142787.6774	151.54041
2010	8	153	142888.9677	153.3952

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	154	143077.3548	156.92277
2010	8	155	143188.4194	159.05093
2010	8	156	143243.8065	160.12592
2010	8	157	143326.2581	161.74327
2010	8	158	143392.871	163.06502
2010	8	159	143440.8065	164.02459
2010	8	160	143465.4194	164.52005
2010	8	161	143476.8387	164.75057
2010	8	162	143495.6774	165.13173
2010	8	163	143523.9032	165.7049
2010	8	164	143546.7742	166.17117
2010	8	165	143579.0645	166.83226
2010	8	166	143729.9355	169.96507
2010	8	167	143784.2258	171.11033
2010	8	168	143858.129	172.68479
2010	8	169	143917.1613	173.95538
2010	8	170	143971.129	175.12711
2010	8	171	143995.9677	175.66969
2010	8	172	144098.4839	177.93113
2010	8	173	144132.9032	178.69844
2010	8	174	144304.9355	182.59514
2010	8	175	144346.8065	183.55929
2010	8	176	144362.2258	183.91591
2010	8	177	144465.9355	186.33668
2010	8	178	144481.6129	186.70599
2010	8	179	144513.4839	187.45954
2010	8	180	144530.871	187.87219
2010	8	181	144557.3548	188.50287
2010	8	182	144594.9677	189.40301
2010	8	183	144622.2258	190.05861
2010	8	184	144644.0645	190.58585
2010	8	185	144666.1935	191.12192
2010	8	186	144687.0645	191.62918
2010	8	187	144714.6774	192.30282
2010	8	188	144747.4839	193.10689
2010	8	189	144781.5484	193.94611
2010	8	190	144827.8065	195.0928
2010	8	191	144860.7097	195.91342
2010	8	192	144914	197.25137
2010	8	193	144932.3548	197.71474
2010	8	194	144967.2258	198.5987
2010	8	195	145050.6452	200.73268
2010	8	196	145073.2258	201.31506
2010	8	197	145103.4194	202.09695
2010	8	198	145124.6129	202.64795
2010	8	199	145140.3226	203.05755
2010	8	200	145171.3871	203.87041
2010	8	201	145188.3226	204.31519
2010	8	202	145228.7742	205.38231
2010	8	203	145252.129	206.00144
2010	8	204	145279.6452	206.73376

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	205	145299.4516	207.26281
2010	8	206	145331.3226	208.11752
2010	8	207	145357.871	208.83269
2010	8	208	145408.3226	210.19988
2010	8	209	145483.3548	212.25292
2010	8	210	145498.1935	212.66176
2010	8	211	145506.4516	212.88969
2010	8	212	145516.3548	213.16341
2010	8	213	145526.2258	213.43666
2010	8	214	145533.3871	213.63516
2010	8	215	145558.2581	214.32624
2010	8	216	145577.6774	214.86768
2010	8	217	145596.7742	215.40171
2010	8	218	145611.8387	215.82409
2010	8	219	145624.1613	216.17032
2010	8	220	145637.5484	216.54721
2010	8	221	145677	217.66242
2010	8	222	145691.9677	218.0873
2010	8	223	145714.7419	218.73566
2010	8	224	145734.1935	219.29124
2010	8	225	145772.7097	220.39625
2010	8	226	145789.0323	220.86652
2010	8	227	145798.4516	221.13844
2010	8	228	145866.3871	223.11135
2010	8	229	145884.9677	223.65455
2010	8	230	145915.2903	224.54438
2010	8	231	145931.0323	225.00797
2010	8	232	145941.129	225.30591
2010	8	233	145981.4839	226.50134
2010	8	234	146030.4516	227.96193
2010	8	235	146063.0968	228.94179
2010	8	236	146093.3548	229.85442
2010	8	237	146106.5484	230.25369
2010	8	238	146150.4516	231.58816
2010	8	239	146203.6774	233.21816
2010	8	240	146236.7097	234.23648
2010	8	241	146264.7742	235.10574
2010	8	242	146278.7097	235.53877
2010	8	243	146346.5161	237.6591
2010	8	244	146371.4516	238.44442
2010	8	245	146458.6452	241.21436
2010	8	246	146465.9677	241.44868
2010	8	247	146521.8065	243.24421
2010	8	248	146540.6452	243.85347
2010	8	249	146563.7742	244.60391
2010	8	250	146619.0645	246.40871
2010	8	251	146702.9677	249.17704
2010	8	252	146717.0968	249.64675
2010	8	253	146737.129	250.31446
2010	8	254	146741.6129	250.4642
2010	8	255	146825.3871	253.28091

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	256	146835.5806	253.62613
2010	8	257	146874.9355	254.96404
2010	8	258	146889.0968	255.44746
2010	8	259	146911.2581	256.20609
2010	8	260	146927.7419	256.77205
2010	8	261	146931.871	256.91404
2010	8	262	146942.2903	257.27275
2010	8	263	146949.5806	257.52408
2010	8	264	146959.7097	257.87374
2010	8	265	146972.3226	258.30991
2010	8	266	147019.5161	259.94945
2010	8	267	147035.4194	260.50463
2010	8	268	147046.4839	260.8917
2010	8	269	147047.0968	260.91316
2010	8	270	147064.5484	261.52506
2010	8	271	147194.7419	266.14229
2010	8	272	147199.6129	266.31683
2010	8	273	147214.8065	266.86213
2010	8	274	147214.8065	266.86213
2010	8	275	147219.8387	267.04302
2010	8	276	147230.8065	267.43775
2010	8	277	147255.9677	268.34583
2010	8	278	147281.7419	269.2797
2010	8	279	147296.1935	269.80494
2010	8	280	147309.3548	270.2843
2010	8	281	147324.7742	270.84714
2010	8	282	147391.129	273.28457
2010	8	283	147438.3226	275.03336
2010	8	284	147501.8387	277.40715
2010	8	285	147523.8065	278.23358
2010	8	286	147534.0323	278.61922
2010	8	287	147599.0323	281.08483
2010	8	288	147639.6452	282.63796
2010	8	289	147687.8065	284.49239
2010	8	290	147709.8065	285.34408
2010	8	291	147802.8065	288.97645
2010	8	292	147822.129	289.7377
2010	8	293	147891.0645	292.47208
2010	8	294	147944.1935	294.59938
2010	8	295	147969.9677	295.63767
2010	8	296	148004.2581	297.02543
2010	8	297	148059.5806	299.27991
2010	8	298	148086.129	300.36863
2010	8	299	148142.3226	302.68781
2010	8	300	148192.2903	304.76697
2010	8	301	148240.0323	306.76853
2010	8	302	148265.8387	307.85659
2010	8	303	148288.9032	308.83271
2010	8	304	148330.3548	310.59575
2010	8	305	148345.9355	311.26134
2010	8	306	148365.3871	312.09455

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	307	148977.7742	339.64429
2010	8	308	149034.0968	342.31104
2010	8	309	149062.3226	343.65619
2010	8	310	149085.7742	344.77827
2010	8	311	149117.3871	346.29728
2010	8	312	149141.2903	347.45076
2010	8	313	149146.0323	347.68009
2010	8	314	149459.6774	363.22685
2010	8	315	149473.4839	363.92861
2010	8	316	149483.5806	364.44277
2010	8	317	149489.4839	364.74375
2010	8	318	149497.9677	365.17678
2010	8	319	149503.3871	365.45369
2010	8	320	149516.7742	366.13872
2010	8	321	149521.3226	366.37178
2010	8	322	149525.0645	366.56365
2010	8	323	149534.1613	367.03054
2010	8	324	149542.7419	367.47154
2010	8	325	149553	367.99952
2010	8	326	149562.5484	368.49172
2010	8	327	149567.3226	368.73809
2010	8	328	149580.2581	369.40653
2010	8	329	149593.7419	370.10474
2010	8	330	149686.8387	374.96511
2010	8	331	149715.4194	376.47128
2010	8	332	149735.5806	377.53775
2010	8	333	149749.6774	378.2854
2010	8	334	149762.3871	378.96087
2010	8	335	149786.2258	380.23139
2010	8	336	149821.0645	382.09657
2010	8	337	149886.4516	385.62438
2010	8	338	149902.1935	386.47902
2010	8	339	149924.9032	387.7156
2010	8	340	149940.3226	388.55768
2010	8	341	150038.9355	393.99065
2010	8	342	150056.6129	394.97333
2010	8	343	150081.7419	396.37484
2010	8	344	150125.7097	398.84013
2010	8	345	150156.2903	400.56467
2010	8	346	150181.3871	401.98603
2010	8	347	150202.2903	403.1741
2010	8	348	150276.3548	407.41458
2010	8	349	150303.2258	408.96505
2010	8	350	150328.2258	410.41334
2010	8	351	150348.1613	411.57223
2010	8	352	150365.4839	412.58213
2010	8	353	150433.5484	416.57644
2010	8	354	150461.1613	418.20886
2010	8	355	150483.5484	419.53744
2010	8	356	150493.9032	420.15351
2010	8	357	150512.8065	421.28071

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	358	150527.2581	422.14468
2010	8	359	150545.6452	423.24671
2010	8	360	150572.6452	424.87062
2010	8	361	150586.2258	425.68998
2010	8	362	150618.4516	427.64113
2010	8	363	150639.2258	428.90407
2010	8	364	150652.2903	429.70039
2010	8	365	150673.6129	431.0035
2010	8	366	150688.5806	431.9208
2010	8	367	150712.7097	433.40401
2010	8	368	150722.9032	434.03226
2010	8	369	150728.7097	434.39057
2010	8	370	150733.5806	434.6914
2010	8	371	150765.1935	436.64929
2010	8	372	150828.1935	440.57963
2010	8	373	150873.5161	443.43082
2010	8	374	150887.5484	444.31762
2010	8	375	150897.0645	444.9201
2010	8	376	150900.9032	445.16338
2010	8	377	150904.3226	445.38021
2010	8	378	150917.871	446.24047
2010	8	379	150926.2903	446.77596
2010	8	380	150929.7419	446.9957
2010	8	381	150938.129	447.53011
2010	8	382	150947.7097	448.14143
2010	8	383	151008.0645	452.01331
2010	8	384	151053.5484	454.95507
2010	8	385	151056.5484	455.14983
2010	8	386	151094.6129	457.62876
2010	8	387	151097.6452	457.82686
2010	8	388	151140.6452	460.64607
2010	8	389	151160.2258	461.93603
2010	8	390	151174	462.84581
2010	8	391	151233.7419	466.81412
2010	8	392	151235.3871	466.92392
2010	8	393	151242.0968	467.372
2010	8	394	151262.1935	468.71688
2010	8	395	151272.2581	469.39196
2010	8	396	151287.3548	470.40655
2010	8	397	151292.3871	470.74527
2010	8	398	151317.2903	472.42537
2010	8	399	151340.0645	473.96749
2010	8	400	151340.0645	473.96749
2010	8	401	151340.0645	473.96749
2010	8	402	151340.0645	473.96749
2010	8	403	151345.0968	474.30897
2010	8	404	151345.129	474.31116
2010	8	405	151415.3548	479.10433
2010	8	406	151420.3871	479.44979
2010	8	407	151430.4839	480.14374
2010	8	408	151435.5161	480.49001

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	409	151440.5806	480.83878
2010	8	410	151440.5806	480.83878
2010	8	411	151445.6129	481.18559
2010	8	412	151450.6452	481.53266
2010	8	413	151450.6452	481.53266
2010	8	414	151450.6452	481.53266
2010	8	415	151468.6452	482.77634
2010	8	416	151468.6452	482.77634
2010	8	417	151468.6774	482.77857
2010	8	418	151815.5806	507.43343
2010	8	419	151815.5806	507.43343
2010	8	420	151820.6129	507.80086
2010	8	421	151820.6129	507.80086
2010	8	422	151820.6452	507.80322
2010	8	423	151820.6452	507.80322
2010	8	424	151820.6452	507.80322
2010	8	425	151820.6452	507.80322
2010	8	426	151874.5806	511.75929
2010	8	427	151874.5806	511.75929
2010	8	428	151874.5806	511.75929
2010	8	429	151897.5806	513.45632
2010	8	430	151897.5806	513.45632
2010	8	431	151897.5806	513.45632
2010	8	432	151897.5806	513.45632
2010	8	433	151907.6129	514.19842
2010	8	434	151912.3871	514.55198
2010	8	435	151926.6774	515.61182
2010	8	436	151926.6774	515.61182
2010	8	437	151926.6774	515.61182
2010	8	438	151926.6774	515.61182
2010	8	439	151926.7097	515.61422
2010	8	440	151945.9355	517.04379
2010	8	441	151965.129	518.4752
2010	8	442	151974.6452	519.18646
2010	8	443	152006.3871	521.56648
2010	8	444	152058	525.46137
2010	8	445	152077.1935	526.91769
2010	8	446	152081.9355	527.27816
2010	8	447	152154.9355	532.86067
2010	8	448	152164.3548	533.58557
2010	8	449	152180.129	534.8019
2010	8	450	152180.8065	534.85421
2010	8	451	152180.8065	534.85421
2010	8	452	152180.8387	534.8567
2010	8	453	152181.5484	534.91149
2010	8	454	152182.2258	534.96381
2010	8	455	152182.2258	534.96381
2010	8	456	152183.5806	535.06845
2010	8	457	152183.6452	535.07343
2010	8	458	152209.3226	537.06079
2010	8	459	152209.3226	537.06079

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	460	152212.0645	537.27348
2010	8	461	152214.0968	537.43117
2010	8	462	152214.7742	537.48375
2010	8	463	152228.4516	538.54645
2010	8	464	152229.2581	538.60918
2010	8	465	152230.3226	538.69199
2010	8	466	152236.8065	539.1967
2010	8	467	152247.0645	539.99622
2010	8	468	152258.0968	540.8575
2010	8	469	152268.9032	541.70257
2010	8	470	152282.1935	542.7438
2010	8	471	152308.2258	544.7895
2010	8	472	152322.5161	545.91598
2010	8	473	152338.2258	547.1572
2010	8	474	152366.7419	549.41794
2010	8	475	152387.4839	551.0686
2010	8	476	152404.7419	552.44604
2010	8	477	152420.0968	553.67465
2010	8	478	152445.3226	555.69941
2010	8	479	152455.8387	556.54582
2010	8	480	152475.7419	558.15152
2010	8	481	152483.8387	558.80614
2010	8	482	152487.0645	559.06717
2010	8	483	152488.7419	559.20296
2010	8	484	152488.7419	559.20296
2010	8	485	152501.1935	560.21202
2010	8	486	152517.4839	561.53509
2010	8	487	152539.2258	563.30611
2010	8	488	152554.3226	564.53934
2010	8	489	152557.7097	564.81642
2010	8	490	152565.9355	565.48992
2010	8	491	152566.6129	565.54543
2010	8	492	152566.6129	565.54543
2010	8	493	152570.3226	565.84948
2010	8	494	152575.5484	566.27809
2010	8	495	152580.9355	566.72029
2010	8	496	152584.6452	567.02501
2010	8	497	152615.6129	569.57557
2010	8	498	152619.3226	569.88193
2010	8	499	152619.3226	569.88193
2010	8	500	152636.5161	571.3041
2010	8	501	152640.2258	571.61144
2010	8	502	152654.3871	572.7863
2010	8	503	152671.0323	574.17051
2010	8	504	152673.3548	574.36393
2010	8	505	152681.7097	575.06031
2010	8	506	152695.2903	576.19417
2010	8	507	152713.1613	577.68985
2010	8	508	152723.8387	578.58544
2010	8	509	152743.3226	580.2235
2010	8	510	152749.3871	580.73436

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	511	152757.7097	581.43622
2010	8	512	152784.2581	583.68111
2010	8	513	152797.2903	584.78646
2010	8	514	152805.0323	585.44415
2010	8	515	152815.4839	586.33328
2010	8	516	152825.5161	587.18809
2010	8	517	152828.7419	587.46323
2010	8	518	152830.2903	587.59534
2010	8	519	152853.1613	589.55046
2010	8	520	152857.0323	589.88205
2010	8	521	152865.5484	590.61225
2010	8	522	152877.6129	591.64833
2010	8	523	152894.871	593.13378
2010	8	524	152897.6774	593.37571
2010	8	525	152912.6774	594.67058
2010	8	526	152920.0968	595.31216
2010	8	527	152939.6774	597.00889
2010	8	528	152949.5806	597.86899
2010	8	529	152957.5806	598.56475
2010	8	530	152959.129	598.69951
2010	8	531	152971.9032	599.81253
2010	8	532	153037	605.51857
2010	8	533	153058.2903	607.39722
2010	8	534	153070.0645	608.43882
2010	8	535	153084.0323	609.67692
2010	8	536	153084.0323	609.67692
2010	8	537	153103.871	611.44001
2010	8	538	153107.6774	611.77891
2010	8	539	153116.1935	612.53785
2010	8	540	153122.6452	613.11346
2010	8	541	153132.8065	614.02122
2010	8	542	153134.8065	614.20005
2010	8	543	153137.8065	614.46841
2010	8	544	153139.8065	614.64739
2010	8	545	153143.0323	614.93617
2010	8	546	153145.0323	615.11529
2010	8	547	153148.0323	615.38407
2010	8	548	153149.0323	615.47369
2010	8	549	153149.0323	615.47369
2010	8	550	153149.0323	615.47369
2010	8	551	153154.0323	615.92201
2010	8	552	153157.7419	616.25485
2010	8	553	153158.7419	616.34461
2010	8	554	153158.7419	616.34461
2010	8	555	153159.7419	616.43438
2010	8	556	153159.7419	616.43438
2010	8	557	153174.7419	617.78258
2010	8	558	153179.4839	618.20943
2010	8	559	153179.4839	618.20943
2010	8	560	153179.4839	618.20943
2010	8	561	153181.4839	618.38956

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	562	153182.4839	618.47964
2010	8	563	153182.4839	618.47964
2010	8	564	153182.4839	618.47964
2010	8	565	153183.4839	618.56974
2010	8	566	153183.4839	618.56974
2010	8	567	153183.4839	618.56974
2010	8	568	153183.4839	618.56974
2010	8	569	153184.2581	618.6395
2010	8	570	153184.2581	618.6395
2010	8	571	153184.2581	618.6395
2010	8	572	153184.2581	618.6395
2010	8	573	153184.2581	618.6395
2010	8	574	153184.2581	618.6395
2010	8	575	153184.2581	618.6395
2010	8	576	153184.2581	618.6395
2010	8	577	153184.2581	618.6395
2010	8	578	153184.2581	618.6395
2010	8	579	153184.3871	618.65113
2010	8	580	153184.3871	618.65113
2010	8	581	153189.4839	619.11062
2010	8	582	153189.4839	619.11062
2010	8	583	153189.8387	619.14262
2010	8	584	153189.8387	619.14262
2010	8	585	153190.9032	619.23865
2010	8	586	153191.6129	619.30267
2010	8	587	153193.0323	619.43073
2010	8	588	153193.0323	619.43073
2010	8	589	153193.0323	619.43073
2010	8	590	153195.6774	619.66947
2010	8	591	153196.0323	619.70151
2010	8	592	153196.0323	619.70151
2010	8	593	153196.0323	619.70151
2010	8	594	153198.3226	619.90831
2010	8	595	153200.7097	620.12394
2010	8	596	153204.9355	620.50584
2010	8	597	153207.2258	620.71293
2010	8	598	153213.3871	621.27039
2010	8	599	153215.3226	621.44562
2010	8	600	153215.3226	621.44562
2010	8	601	153216.0323	621.50988
2010	8	602	153216.0323	621.50988
2010	8	603	153219.5484	621.82838
2010	8	604	153219.5484	621.82838
2010	8	605	153221.129	621.97162
2010	8	606	153221.129	621.97162
2010	8	607	153221.4839	622.00378
2010	8	608	153235.7097	623.29454
2010	8	609	153235.7097	623.29454
2010	8	610	153238.871	623.58175
2010	8	611	153240.4516	623.72542
2010	8	612	153245.1935	624.15661

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	613	153245.1935	624.15661
2010	8	614	153245.1935	624.15661
2010	8	615	153245.1935	624.15661
2010	8	616	153245.1935	624.15661
2010	8	617	153245.1935	624.15661
2010	8	618	153245.1935	624.15661
2010	8	619	153245.1935	624.15661
2010	8	620	153245.1935	624.15661
2010	8	621	153245.1935	624.15661
2010	8	622	153245.1935	624.15661
2010	8	623	153245.1935	624.15661
2010	8	624	153245.1935	624.15661
2010	8	625	153245.1935	624.15661
2010	8	626	153245.1935	624.15661
2010	8	627	153245.1935	624.15661
2010	8	628	153245.1935	624.15661
2010	8	629	153245.1935	624.15661
2010	8	630	153245.1935	624.15661
2010	8	631	153245.1935	624.15661
2010	8	632	153245.1935	624.15661
2010	8	633	153245.1935	624.15661
2010	8	634	153245.1935	624.15661
2010	8	635	153245.1935	624.15661
2010	8	636	153245.1935	624.15661
2010	8	637	153245.1935	624.15661
2010	8	638	153299.8387	629.14843
2010	8	639	153299.8387	629.14843
2010	8	640	153299.8387	629.14843
2010	8	641	153299.8387	629.14843
2010	8	642	153299.8387	629.14843
2010	8	643	153299.8387	629.14843
2010	8	644	153299.8387	629.14843
2010	8	645	153299.8387	629.14843
2010	8	646	153299.8387	629.14843
2010	8	647	153299.8387	629.14843
2010	8	648	153299.8387	629.14843
2010	8	649	153300.7419	629.23129
2010	8	650	153300.7419	629.23129
2010	8	651	153300.7419	629.23129
2010	8	652	153300.7419	629.23129
2010	8	653	153300.7419	629.23129
2010	8	654	153300.7419	629.23129
2010	8	655	153300.7419	629.23129
2010	8	656	153300.7419	629.23129
2010	8	657	153303.9677	629.52732
2010	8	658	153303.9677	629.52732
2010	8	659	153303.9677	629.52732
2010	8	660	153303.9677	629.52732
2010	8	661	153306.6774	629.77611
2010	8	662	153306.6774	629.77611
2010	8	663	153306.6774	629.77611

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	664	153306.6774	629.77611
2010	8	665	153306.6774	629.77611
2010	8	666	153308.4839	629.94202
2010	8	667	153308.4839	629.94202
2010	8	668	153308.4839	629.94202
2010	8	669	153308.4839	629.94202
2010	8	670	153309.3871	630.02499
2010	8	671	153311.1935	630.19097
2010	8	672	153311.1935	630.19097
2010	8	673	153313	630.357
2010	8	674	153316.6129	630.68919
2010	8	675	153317.5161	630.77227
2010	8	676	153319.8065	630.98298
2010	8	677	153319.8065	630.98298
2010	8	678	153322.5161	631.23237
2010	8	679	153323.4194	631.31552
2010	8	680	153323.4194	631.31552
2010	8	681	153323.4194	631.31552
2010	8	682	153326.129	631.56505
2010	8	683	153327.0323	631.64825
2010	8	684	153329.3871	631.86522
2010	8	685	153329.871	631.90981
2010	8	686	153329.871	631.90981
2010	8	687	153329.871	631.90981
2010	8	688	153329.871	631.90981
2010	8	689	153331.3226	632.0436
2010	8	690	153331.3226	632.0436
2010	8	691	153387.3226	637.22804
2010	8	692	153388.2903	637.31803
2010	8	693	153388.2903	637.31803
2010	8	694	153389.2581	637.40803
2010	8	695	153389.7419	637.45303
2010	8	696	153389.7419	637.45303
2010	8	697	153390.7097	637.54305
2010	8	698	153390.7097	637.54305
2010	8	699	153391.7742	637.64209
2010	8	700	153392.2581	637.68711
2010	8	701	153392.2581	637.68711
2010	8	702	153393.2258	637.77717
2010	8	703	153395.1613	637.95732
2010	8	704	153396.6129	638.09247
2010	8	705	153396.6129	638.09247
2010	8	706	153397.2903	638.15555
2010	8	707	153398.4516	638.2637
2010	8	708	153398.9355	638.30877
2010	8	709	153398.9355	638.30877
2010	8	710	153399.129	638.3268
2010	8	711	153399.129	638.3268
2010	8	712	153399.6129	638.37187
2010	8	713	153399.6129	638.37187
2010	8	714	153400.5806	638.46203

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	715	153400.7742	638.48006
2010	8	716	153401.3548	638.53416
2010	8	717	153401.3548	638.53416
2010	8	718	153401.3548	638.53416
2010	8	719	153402.129	638.60631
2010	8	720	153402.9032	638.67846
2010	8	721	153402.9032	638.67846
2010	8	722	153402.9032	638.67846
2010	8	723	153403.0968	638.6965
2010	8	724	153403.2903	638.71454
2010	8	725	153403.2903	638.71454
2010	8	726	153404.0645	638.7867
2010	8	727	153404.2581	638.80475
2010	8	728	153454.6452	643.52021
2010	8	729	153454.6452	643.52021
2010	8	730	153454.6452	643.52021
2010	8	731	153454.6452	643.52021
2010	8	732	153454.6452	643.52021
2010	8	733	153454.6452	643.52021
2010	8	734	153454.6452	643.52021
2010	8	735	153454.6452	643.52021
2010	8	736	153454.6452	643.52021
2010	8	737	153454.6452	643.52021
2010	8	738	153454.6452	643.52021
2010	8	739	153454.6452	643.52021
2010	8	740	153454.6452	643.52021
2010	8	741	153454.6452	643.52021
2010	8	742	153454.6452	643.52021
2010	8	743	153454.6452	643.52021
2010	8	744	153454.6452	643.52021
2010	8	745	153482.6452	646.15644
2010	8	746	153482.6452	646.15644
2010	8	747	153482.6452	646.15644
2010	8	748	153488.7097	646.72892
2010	8	749	153491.7742	647.01841
2010	8	750	153494.8065	647.30498
2010	8	751	153506.6452	648.42513
2010	8	752	153509.7097	648.71542
2010	8	753	153512.7742	649.00585
2010	8	754	153515.7097	649.28418
2010	8	755	153515.7097	649.28418
2010	8	756	153518.7097	649.56875
2010	8	757	153518.7097	649.56875
2010	8	758	153533.7097	650.9936
2010	8	759	153533.7097	650.9936
2010	8	760	153533.7097	650.9936
2010	8	761	153533.7097	650.9936
2010	8	762	153539.7742	651.5706
2010	8	763	153548.871	652.43711
2010	8	764	153548.871	652.43711
2010	8	765	153561.0645	653.60051

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	766	153561.0645	653.60051
2010	8	767	153561.0645	653.60051
2010	8	768	153564.0968	653.89016
2010	8	769	153567.129	654.17995
2010	8	770	153567.129	654.17995
2010	8	771	153576.6129	655.08718
2010	8	772	153576.6129	655.08718
2010	8	773	153576.6129	655.08718
2010	8	774	153576.6129	655.08718
2010	8	775	153576.6129	655.08718
2010	8	776	153576.6129	655.08718
2010	8	777	153576.6129	655.08718
2010	8	778	153576.6129	655.08718
2010	8	779	153576.6129	655.08718
2010	8	780	153576.6129	655.08718
2010	8	781	153576.6129	655.08718
2010	8	782	153576.6129	655.08718
2010	8	783	153576.6129	655.08718
2010	8	784	153576.6129	655.08718
2010	8	785	153576.6129	655.08718
2010	8	786	153576.6129	655.08718
2010	8	787	153576.6129	655.08718
2010	8	788	153576.6129	655.08718
2010	8	789	153576.6129	655.08718
2010	8	790	153576.6129	655.08718
2010	8	791	153576.6129	655.08718
2010	8	792	153576.6129	655.08718
2010	8	793	153607.6129	658.0619
2010	8	794	153607.6129	658.0619
2010	8	795	153607.6129	658.0619
2010	8	796	153607.6129	658.0619
2010	8	797	153607.6129	658.0619
2010	8	798	153640.2581	661.20989
2010	8	799	153640.2581	661.20989
2010	8	800	153640.2581	661.20989
2010	8	801	153640.2581	661.20989
2010	8	802	153640.2581	661.20989
2010	8	803	153640.2581	661.20989
2010	8	804	153641.8065	661.35959
2010	8	805	153646.5484	661.81829
2010	8	806	153652.8387	662.42728
2010	8	807	153655.9355	662.7273
2010	8	808	153663.6774	663.478
2010	8	809	153665.2258	663.62824
2010	8	810	153665.2258	663.62824
2010	8	811	153671.4839	664.23585
2010	8	812	153671.4839	664.23585
2010	8	813	153676.1935	664.69351
2010	8	814	153684.0968	665.46225
2010	8	815	153710.6774	668.05459
2010	8	816	153718.5161	668.82111

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	817	153720.0645	668.97263
2010	8	818	153727.871	669.7371
2010	8	819	153731.0323	670.04694
2010	8	820	153732.6129	670.20192
2010	8	821	153734.1935	670.35693
2010	8	822	153762.6452	673.15364
2010	8	823	153770.5484	673.93268
2010	8	824	153776.871	674.5566
2010	8	825	153781.6129	675.02494
2010	8	826	153781.6129	675.02494
2010	8	827	153781.6129	675.02494
2010	8	828	153781.6129	675.02494
2010	8	829	153781.6129	675.02494
2010	8	830	153781.6129	675.02494
2010	8	831	153781.6129	675.02494
2010	8	832	153781.6129	675.02494
2010	8	833	153786.5484	675.51275
2010	8	834	153791.4839	676.00094
2010	8	835	153791.4839	676.00094
2010	8	836	153791.4839	676.00094
2010	8	837	153793.129	676.16375
2010	8	838	153793.129	676.16375
2010	8	839	153794.7742	676.32661
2010	8	840	153796.4194	676.4895
2010	8	841	153799.7097	676.81541
2010	8	842	153801.3548	676.97843
2010	8	843	153803	677.14149
2010	8	844	153807.9355	677.63091
2010	8	845	153814.5161	678.28406
2010	8	846	153821.0968	678.93787
2010	8	847	153826.5806	679.48322
2010	8	848	153826.5806	679.48322
2010	8	849	153829.871	679.81065
2010	8	850	153839.7419	680.79393
2010	8	851	153873.2258	684.14054
2010	8	852	153915.2903	688.3693
2010	8	853	153925.7097	689.42101
2010	8	854	153937.2258	690.58538
2010	8	855	153946.5484	691.52948
2010	8	856	153955.7419	692.46184
2010	8	857	153962.9677	693.19557
2010	8	858	153962.9677	693.19557
2010	8	859	153967.9032	693.69721
2010	8	860	153969	693.80874
2010	8	861	153972.0645	694.12045
2010	8	862	153975.3871	694.45859
2010	8	863	153975.3871	694.45859
2010	8	864	153977.9032	694.71476
2010	8	865	153983.3548	695.27015
2010	8	866	153985.0323	695.44114
2010	8	867	153985.0323	695.44114

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	868	153995.9355	696.55361
2010	8	869	154000.129	696.98198
2010	8	870	154014.3871	698.44051
2010	8	871	154014.8065	698.48346
2010	8	872	154014.8065	698.48346
2010	8	873	154019.8387	698.99903
2010	8	874	154031.1613	700.16054
2010	8	875	154037.4516	700.80669
2010	8	876	154044.1613	701.49662
2010	8	877	154058	702.92184
2010	8	878	154081.4839	705.34736
2010	8	879	154089.871	706.21575
2010	8	880	154090.7097	706.30265
2010	8	881	154093.2258	706.56342
2010	8	882	154095.3226	706.7808
2010	8	883	154095.3226	706.7808
2010	8	884	154099.0968	707.17227
2010	8	885	154099.9355	707.25929
2010	8	886	154100.3548	707.30281
2010	8	887	154101.6129	707.43337
2010	8	888	154101.6129	707.43337
2010	8	889	154101.6129	707.43337
2010	8	890	154103.2581	707.60415
2010	8	891	154103.2581	707.60415
2010	8	892	154103.2581	707.60415
2010	8	893	154103.2581	707.60415
2010	8	894	154103.2581	707.60415
2010	8	895	154103.8065	707.66109
2010	8	896	154103.8065	707.66109
2010	8	897	154103.8065	707.66109
2010	8	898	154104.3548	707.71803
2010	8	899	154104.3548	707.71803
2010	8	900	154104.9032	707.77497
2010	8	901	154104.9032	707.77497
2010	8	902	154104.9032	707.77497
2010	8	903	154106.5484	707.94584
2010	8	904	154135.0968	710.91774
2010	8	905	154154.7419	712.97041
2010	8	906	154154.7419	712.97041
2010	8	907	154154.7419	712.97041
2010	8	908	154154.7419	712.97041
2010	8	909	154155.8387	713.08519
2010	8	910	154157.4839	713.2574
2010	8	911	154157.4839	713.2574
2010	8	912	154158.5806	713.37223
2010	8	913	154160.7742	713.60195
2010	8	914	154164.0645	713.94668
2010	8	915	154164.0645	713.94668
2010	8	916	154164.0645	713.94668
2010	8	917	154164.6129	714.00415
2010	8	918	154164.6129	714.00415

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	919	154164.6129	714.00415
2010	8	920	154164.6129	714.00415
2010	8	921	154164.6129	714.00415
2010	8	922	154164.6129	714.00415
2010	8	923	154164.6129	714.00415
2010	8	924	154164.6129	714.00415
2010	8	925	154164.6129	714.00415
2010	8	926	154164.6129	714.00415
2010	8	927	154164.6129	714.00415
2010	8	928	154164.6129	714.00415
2010	8	929	154164.6129	714.00415
2010	8	930	154164.6129	714.00415
2010	8	931	154164.6129	714.00415
2010	8	932	154164.6129	714.00415
2010	8	933	154168.4839	714.40997
2010	8	934	154168.4839	714.40997
2010	8	935	154168.4839	714.40997
2010	8	936	154168.4839	714.40997
2010	8	937	154168.4839	714.40997
2010	8	938	154168.4839	714.40997
2010	8	939	154168.4839	714.40997
2010	8	940	154168.4839	714.40997
2010	8	941	154168.4839	714.40997
2010	8	942	154168.4839	714.40997
2010	8	943	154168.4839	714.40997
2010	8	944	154168.4839	714.40997
2010	8	945	154168.4839	714.40997
2010	8	946	154168.4839	714.40997
2010	8	947	154168.4839	714.40997
2010	8	948	154168.4839	714.40997
2010	8	949	154168.4839	714.40997
2010	8	950	154168.4839	714.40997
2010	8	951	154168.4839	714.40997
2010	8	952	154168.4839	714.40997
2010	8	953	154168.4839	714.40997
2010	8	954	154168.4839	714.40997
2010	8	955	154168.4839	714.40997
2010	8	956	154168.4839	714.40997
2010	8	957	154269.4839	725.08439
2010	8	958	154288.6129	727.12486
2010	8	959	154288.6129	727.12486
2010	8	960	154288.6129	727.12486
2010	8	961	154288.6129	727.12486
2010	8	962	154288.6129	727.12486
2010	8	963	154288.6129	727.12486
2010	8	964	154288.6129	727.12486
2010	8	965	154288.6129	727.12486
2010	8	966	154288.6129	727.12486
2010	8	967	154288.6129	727.12486
2010	8	968	154288.6129	727.12486
2010	8	969	154288.6129	727.12486

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	8	970	154288.6129	727.12486
2010	8	971	154288.6129	727.12486
2010	8	972	154288.6129	727.12486
2010	8	973	154288.6129	727.12486
2010	8	974	154288.6129	727.12486
2010	8	975	154288.6129	727.12486
2010	8	976	154288.6129	727.12486
2010	8	977	154288.6129	727.12486
2010	8	978	154288.6129	727.12486
2010	8	979	154288.6129	727.12486
2010	8	980	154288.6129	727.12486
2010	8	981	154293.6129	727.65919
2010	8	982	154293.6129	727.65919
2010	8	983	154293.6129	727.65919
2010	8	984	154293.6129	727.65919
2010	8	985	154293.6129	727.65919
2010	8	986	154293.6129	727.65919
2010	8	987	154293.6129	727.65919
2010	8	988	154293.6129	727.65919
2010	8	989	154293.6129	727.65919
2010	8	990	154293.6129	727.65919
2010	8	991	154293.6129	727.65919
2010	8	992	154293.6129	727.65919
2010	8	993	154293.6129	727.65919
2010	8	994	154293.6129	727.65919
2010	8	995	154293.6129	727.65919
2010	8	996	154293.6129	727.65919
2010	8	997	154293.6129	727.65919
2010	8	998	154350.6129	733.77978
2010	8	999	154351.5161	733.87721

September 2010

Net Benefit Tab

Effective_month	Test_result
9/1/2010 0:00	\$34.07

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	1.463084981	1.131105214

Curve Parameters Tab

a	b	c	d
2.765898743	0.000137465	14.08893109	31.82132165

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	1	18940.36667	31.82133
2010	9	2	19962.46667	31.82133
2010	9	3	20004.4	31.82133
2010	9	4	20582.9	31.82133
2010	9	5	24181.5	31.82134
2010	9	6	28581.73333	31.82135
2010	9	7	31008.2	31.82136
2010	9	8	31175.3	31.82137
2010	9	9	32118.9	31.82137
2010	9	10	32214.93333	31.82137
2010	9	11	32260.1	31.82137
2010	9	12	32449.8	31.82137
2010	9	13	32724.36667	31.82138
2010	9	14	32858.26667	31.82138
2010	9	15	34084.73333	31.82139
2010	9	16	34409.76667	31.82139
2010	9	17	34509.6	31.82139
2010	9	18	35168.7	31.8214
2010	9	19	36275.06667	31.82141
2010	9	20	37406.2	31.82143
2010	9	21	40436.1	31.82149
2010	9	22	42084.46667	31.82153
2010	9	23	45531.83333	31.82166
2010	9	24	48086.23333	31.8218
2010	9	25	52526.73333	31.82222
2010	9	26	56897.46667	31.82298
2010	9	27	61797.06667	31.8246
2010	9	28	68026.13333	31.82913
2010	9	29	74821.46667	31.84146
2010	9	30	79171.6	31.85825
2010	9	31	83317.23333	31.88713
2010	9	32	85849.33333	31.91499
2010	9	33	87769.26667	31.94373
2010	9	34	89035.2	31.96735
2010	9	35	90681.9	32.00502
2010	9	36	91979.2	32.04143
2010	9	37	93423.26667	32.09051
2010	9	38	95234.2	32.1678
2010	9	39	96363.43333	32.22686
2010	9	40	97549.86667	32.29978
2010	9	41	98683.4	32.38167
2010	9	42	99641.53333	32.46173
2010	9	43	100564.7667	32.54967
2010	9	44	101649.2667	32.66853
2010	9	45	102591.2667	32.78739
2010	9	46	103420.2333	32.90572
2010	9	47	104076.9333	33.00966
2010	9	48	104942.4667	33.16202
2010	9	49	106283.0333	33.43746
2010	9	50	107106.3667	33.63398
2010	9	51	107907.8	33.8482

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	52	108634.5667	34.06427
2010	9	53	109656.3333	34.40757
2010	9	54	110413	34.69522
2010	9	55	111149	35.00569
2010	9	56	111899.7667	35.35696
2010	9	57	112519.7333	35.67607
2010	9	58	113082.7	35.99072
2010	9	59	114317.2333	36.77356
2010	9	60	114803.2	37.12061
2010	9	61	115247.0667	37.45881
2010	9	62	115669.5	37.8007
2010	9	63	116438.5	38.47719
2010	9	64	117107.8	39.12798
2010	9	65	117878.1	39.95611
2010	9	66	118409.8	40.58186
2010	9	67	119206.2	41.61032
2010	9	68	119565.9333	42.11364
2010	9	69	119961.4333	42.69693
2010	9	70	120366.5333	43.32866
2010	9	71	121117.0333	44.59758
2010	9	72	121974.9	46.22031
2010	9	73	122268.4333	46.82162
2010	9	74	122676.5667	47.69965
2010	9	75	123086.7667	48.63392
2010	9	76	123288.4	49.11312
2010	9	77	123876.2333	50.58952
2010	9	78	124344.7	51.85587
2010	9	79	124751.8	53.02553
2010	9	80	125001.4333	53.77629
2010	9	81	125265	54.59781
2010	9	82	125644.1333	55.83377
2010	9	83	125947.1	56.86946
2010	9	84	126199.5667	57.76656
2010	9	85	126385.3667	58.44723
2010	9	86	126940.9333	60.59091
2010	9	87	127062.4	61.08213
2010	9	88	127226	61.75701
2010	9	89	127361.1667	62.32633
2010	9	90	127608.7333	63.39729
2010	9	91	128210.6333	66.16056
2010	9	92	128361.6	66.89077
2010	9	93	128573.9667	67.94432
2010	9	94	128851.4333	69.36867
2010	9	95	128969.4333	69.99131
2010	9	96	129045.3333	70.39725
2010	9	97	129166.5333	71.05444
2010	9	98	129361.3	72.13406
2010	9	99	129578.8333	73.37505
2010	9	100	129643.5	73.75127
2010	9	101	129830.5	74.8585
2010	9	102	129935.2333	75.49134

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	103	130097.1667	76.48819
2010	9	104	130179.2333	77.00204
2010	9	105	130315.7667	77.87006
2010	9	106	130419.1667	78.53851
2010	9	107	130489.6	78.99939
2010	9	108	130594.9667	79.69735
2010	9	109	130660.7333	80.13822
2010	9	110	130753.9333	80.76996
2010	9	111	130872.3333	81.58444
2010	9	112	130974.4	82.29742
2010	9	113	131116.4	83.30639
2010	9	114	131219.1333	84.0489
2010	9	115	131356.2333	85.05651
2010	9	116	131541.7667	86.4511
2010	9	117	131683.4	87.54024
2010	9	118	131838.6333	88.75893
2010	9	119	132019.8667	90.2155
2010	9	120	132113.6333	90.98367
2010	9	121	132195.4333	91.66205
2010	9	122	132306.7333	92.59759
2010	9	123	132409.4667	93.4741
2010	9	124	132555.0333	94.73775
2010	9	125	132658.9	95.6552
2010	9	126	132764.2667	96.59958
2010	9	127	132840.1667	97.2885
2010	9	128	132993.5	98.70269
2010	9	129	133091.3333	99.62092
2010	9	130	133157.5333	100.2494
2010	9	131	133248.0667	101.11832
2010	9	132	133343.9	102.05014
2010	9	133	133477.5333	103.37046
2010	9	134	133572.3667	104.32246
2010	9	135	133713.8333	105.76619
2010	9	136	133806.7333	106.72988
2010	9	137	133947.8667	108.21799
2010	9	138	134031.8333	109.11733
2010	9	139	134211.8667	111.08145
2010	9	140	134282.2667	111.863
2010	9	141	134528	114.65193
2010	9	142	134682.1	116.45023
2010	9	143	134846.3667	118.41019
2010	9	144	135025.4	120.59807
2010	9	145	135228.1667	123.14282
2010	9	146	135381.6	125.1168
2010	9	147	135507.3667	126.76661
2010	9	148	135630.1333	128.40521
2010	9	149	135721.1333	129.63804
2010	9	150	135809.1667	130.84564
2010	9	151	135939.4667	132.66046
2010	9	152	136017.5333	133.76367
2010	9	153	136103.6	134.99392

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	154	136477.1667	140.50816
2010	9	155	136754.7	144.7948
2010	9	156	136808.2333	145.64089
2010	9	157	136859.9667	146.46456
2010	9	158	136912.5667	147.30814
2010	9	159	136940.7333	147.76241
2010	9	160	136974.7333	148.31315
2010	9	161	137085.3333	150.12282
2010	9	162	137135.4667	150.95235
2010	9	163	137176.0333	151.62784
2010	9	164	137214.8333	152.2775
2010	9	165	137284.5667	153.45397
2010	9	166	137465.0333	156.55223
2010	9	167	137501.4667	157.18723
2010	9	168	137584.5	158.64653
2010	9	169	137645.2	159.72407
2010	9	170	137726.2	161.17623
2010	9	171	137832.5	163.10702
2010	9	172	137918.6667	164.69325
2010	9	173	137982.4667	165.88006
2010	9	174	138040.1667	166.96254
2010	9	175	138176.1667	169.54865
2010	9	176	138234.5	170.673
2010	9	177	138468.2333	175.27093
2010	9	178	138629.0333	178.52224
2010	9	179	138696.0667	179.8993
2010	9	180	138764.8333	181.3254
2010	9	181	138830.5	182.70002
2010	9	182	138877.7667	183.69729
2010	9	183	138915.2	184.49176
2010	9	184	138962.6	185.50373
2010	9	185	139031.9667	186.99678
2010	9	186	139098.3333	188.43883
2010	9	187	139137.3333	189.29249
2010	9	188	139177.2333	190.17066
2010	9	189	139210.8333	190.91397
2010	9	190	139234.7333	191.44482
2010	9	191	139260.7333	192.02432
2010	9	192	139283.6667	192.53722
2010	9	193	139309.2	193.11019
2010	9	194	139328.0667	193.53488
2010	9	195	139347.1	193.96445
2010	9	196	139563.7333	198.93489
2010	9	197	139580.7	199.33055
2010	9	198	139595.9333	199.68658
2010	9	199	139612.1667	200.06682
2010	9	200	139629.5	200.47378
2010	9	201	139674.3667	201.53175
2010	9	202	139701.1333	202.16607
2010	9	203	139721.8	202.65745
2010	9	204	139740.8667	203.11205

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	205	139773.4667	203.89213
2010	9	206	139792.6333	204.35242
2010	9	207	139829.2333	205.2348
2010	9	208	139903.5667	207.04079
2010	9	209	140011.4333	209.695
2010	9	210	140020.7	209.92489
2010	9	211	140058.7667	210.87236
2010	9	212	140068.9	211.12543
2010	9	213	140100.6333	211.92024
2010	9	214	140119.7667	212.40117
2010	9	215	140149.9	213.16119
2010	9	216	140196.0667	214.33182
2010	9	217	140235.5667	215.33939
2010	9	218	140263.5	216.05528
2010	9	219	140316	217.40834
2010	9	220	140364.6	218.66974
2010	9	221	140430.2667	220.38773
2010	9	222	140473.2667	221.52126
2010	9	223	140530.3333	223.03613
2010	9	224	140570.7667	224.11678
2010	9	225	140600.7333	224.92162
2010	9	226	140634.2333	225.82536
2010	9	227	140668.7	226.75958
2010	9	228	140693.7667	227.44184
2010	9	229	140726.1333	228.32632
2010	9	230	140745.6667	228.86205
2010	9	231	140778.2667	229.75939
2010	9	232	140799.1	230.33498
2010	9	233	140837.6	231.40309
2010	9	234	140855.3	231.89607
2010	9	235	140870.5	232.32039
2010	9	236	140913.9333	233.53783
2010	9	237	140916.8667	233.62032
2010	9	238	140954.2667	234.675
2010	9	239	140964.3667	234.96076
2010	9	240	140983.6333	235.507
2010	9	241	141028.7667	236.79235
2010	9	242	141066.8	237.8818
2010	9	243	141086.6	238.45125
2010	9	244	141153.6333	240.39085
2010	9	245	141158.9667	240.54595
2010	9	246	141160.3333	240.58571
2010	9	247	141165.3333	240.73125
2010	9	248	141187.1	241.36601
2010	9	249	141192.4333	241.52183
2010	9	250	141198.7667	241.70702
2010	9	251	141275	243.94902
2010	9	252	141292.3	244.46113
2010	9	253	141311.0667	245.01806
2010	9	254	141321.7333	245.33525
2010	9	255	141327.5667	245.50892

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	256	141379.5667	247.06329
2010	9	257	141389.4667	247.3605
2010	9	258	141438.9333	248.8517
2010	9	259	141442.4	248.95659
2010	9	260	141459.3667	249.47067
2010	9	261	141513.9333	251.13231
2010	9	262	141522.2	251.38514
2010	9	263	141530.3667	251.63521
2010	9	264	141534.9667	251.77618
2010	9	265	141549.9667	252.23652
2010	9	266	141558.8	252.50806
2010	9	267	141609.1667	254.06275
2010	9	268	141624.5667	254.54028
2010	9	269	141631.8	254.76494
2010	9	270	141637.0667	254.92865
2010	9	271	141641.0333	255.05204
2010	9	272	141646.6667	255.22738
2010	9	273	141651.3667	255.37378
2010	9	274	141656.2333	255.52547
2010	9	275	141668.3667	255.9041
2010	9	276	141678.1333	256.20934
2010	9	277	141688.0333	256.51918
2010	9	278	141719.4667	257.50578
2010	9	279	141727.9	257.77121
2010	9	280	141741.2333	258.1915
2010	9	281	141755.5667	258.64419
2010	9	282	141767.1333	259.01016
2010	9	283	141871.3	262.33269
2010	9	284	141899.4	263.23727
2010	9	285	141911.9667	263.64296
2010	9	286	141928.7667	264.18642
2010	9	287	141960.7667	265.22512
2010	9	288	142015.4	267.00921
2010	9	289	142080.7333	269.16064
2010	9	290	142147.2	271.36958
2010	9	291	142179.6667	272.45603
2010	9	292	142210.7667	273.50137
2010	9	293	142259.5	275.14855
2010	9	294	142292.0333	276.25442
2010	9	295	142378.9	279.23185
2010	9	296	142407.4667	280.21891
2010	9	297	142446.9	281.5879
2010	9	298	142462.2	282.1211
2010	9	299	142480.2	282.74984
2010	9	300	142559.8667	285.55165
2010	9	301	142572.9	286.01299
2010	9	302	142593.2667	286.73558
2010	9	303	142603.6667	287.10536
2010	9	304	142636.4	288.27271
2010	9	305	142651.0667	288.7975
2010	9	306	142726.1667	291.50149

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	307	143355.1	315.29263
2010	9	308	143386.9333	316.55316
2010	9	309	143429.6333	318.25279
2010	9	310	143444.8667	318.86159
2010	9	311	143470.5	319.88895
2010	9	312	143485.2333	320.48111
2010	9	313	143507.4667	321.37701
2010	9	314	143849.8333	335.52923
2010	9	315	143873.5667	336.53553
2010	9	316	143929.2	338.90751
2010	9	317	143954	339.97082
2010	9	318	143971.5333	340.72479
2010	9	319	144000	341.95285
2010	9	320	144012.1333	342.47777
2010	9	321	144022.6333	342.93274
2010	9	322	144053.7	344.28279
2010	9	323	144067.6	344.88873
2010	9	324	144122.6	347.29788
2010	9	325	144173.9	349.56166
2010	9	326	144191.6333	350.34798
2010	9	327	144231.9	352.14068
2010	9	328	144273.3	353.99436
2010	9	329	144317.1333	355.96869
2010	9	330	144347.9667	357.36472
2010	9	331	144364.8333	358.13093
2010	9	332	144386.5667	359.12087
2010	9	333	144405.7	359.99488
2010	9	334	144418.8333	360.59615
2010	9	335	144438.2333	361.48635
2010	9	336	144458.5333	362.42042
2010	9	337	144475.4667	363.20161
2010	9	338	144495.3	364.11892
2010	9	339	144508.9	364.74941
2010	9	340	144523.7	365.43689
2010	9	341	144545.7	366.46144
2010	9	342	144560.6	367.15712
2010	9	343	144583.9	368.24791
2010	9	344	144599.7667	368.99273
2010	9	345	144686.4	373.08871
2010	9	346	144737.6333	375.53438
2010	9	347	144743.8333	375.83152
2010	9	348	144755.4333	376.38817
2010	9	349	144761.6667	376.68766
2010	9	350	144769.3667	377.05797
2010	9	351	144774.5333	377.30668
2010	9	352	144802.5	378.656
2010	9	353	144811.6	379.09618
2010	9	354	144827.0667	379.84562
2010	9	355	144853.7667	381.14318
2010	9	356	144979.2333	387.30565
2010	9	357	145000.7333	388.37251

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	358	145017.0667	389.18513
2010	9	359	145035.4667	390.10279
2010	9	360	145041.3333	390.39588
2010	9	361	145047.4333	390.70087
2010	9	362	145134.6333	395.08925
2010	9	363	145143.3	395.52833
2010	9	364	145153.5667	396.04915
2010	9	365	145158.9	396.32
2010	9	366	145178.5667	397.32051
2010	9	367	145198.8667	398.35612
2010	9	368	145209.6	398.90486
2010	9	369	145339.9667	405.63588
2010	9	370	145371.8667	407.30163
2010	9	371	145382.1667	407.84106
2010	9	372	145394.4333	408.4845
2010	9	373	145418.7	409.76063
2010	9	374	145426.9	410.19283
2010	9	375	145435.0333	410.622
2010	9	376	145467.2333	412.32588
2010	9	377	145475.4667	412.76278
2010	9	378	145484	413.21613
2010	9	379	145503.2	414.23814
2010	9	380	145511.9	414.70214
2010	9	381	145520.8667	415.18095
2010	9	382	145530.4333	415.69246
2010	9	383	145543.3	416.38149
2010	9	384	145557.8	417.15947
2010	9	385	145561.5333	417.36003
2010	9	386	145565.7667	417.58758
2010	9	387	145569.1	417.76685
2010	9	388	145572.4333	417.9462
2010	9	389	145621.8	420.61217
2010	9	390	145643.0667	421.7663
2010	9	391	145646.5667	421.95657
2010	9	392	145649.8333	422.13424
2010	9	393	145653.1667	422.31563
2010	9	394	145656.5333	422.4989
2010	9	395	145659.8	422.67682
2010	9	396	145663.2333	422.86391
2010	9	397	145666.6	423.04744
2010	9	398	145669.9	423.22743
2010	9	399	145693.6333	424.52432
2010	9	400	145786.1333	429.62004
2010	9	401	145830.7333	432.10059
2010	9	402	145844.4333	432.86565
2010	9	403	145878.9667	434.80062
2010	9	404	145888.7	435.34768
2010	9	405	145932.8667	437.83941
2010	9	406	145941.4333	438.32449
2010	9	407	145955.1667	439.10334
2010	9	408	145963.6333	439.58425

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	409	146063.0667	445.27475
2010	9	410	146066.4	445.46688
2010	9	411	146069.7333	445.65911
2010	9	412	146095.5667	447.15187
2010	9	413	146095.6	447.1538
2010	9	414	146095.6333	447.15573
2010	9	415	146095.6667	447.15766
2010	9	416	146095.7	447.15959
2010	9	417	146095.7333	447.16151
2010	9	418	146095.7667	447.16344
2010	9	419	146445.2333	467.89487
2010	9	420	146445.3	467.89892
2010	9	421	146445.3667	467.90298
2010	9	422	146445.4333	467.90703
2010	9	423	146515.4667	472.18458
2010	9	424	146515.5333	472.18868
2010	9	425	146515.5667	472.19072
2010	9	426	146515.6333	472.19481
2010	9	427	146520.8667	472.51615
2010	9	428	146526.1333	472.83976
2010	9	429	146547	474.12428
2010	9	430	146552.2333	474.44702
2010	9	431	146552.3	474.45113
2010	9	432	146573.1333	475.73828
2010	9	433	146578.3	476.05807
2010	9	434	146616.8333	478.45037
2010	9	435	146622.1	478.77834
2010	9	436	146643.0333	480.08432
2010	9	437	146643.1	480.08849
2010	9	438	146658.8333	481.07257
2010	9	439	146675.2333	482.10065
2010	9	440	146677.3667	482.23456
2010	9	441	146687.5667	482.87535
2010	9	442	146688.3333	482.92355
2010	9	443	146708.3667	484.18489
2010	9	444	146708.4333	484.18909
2010	9	445	146771.7	488.19574
2010	9	446	146771.7667	488.19998
2010	9	447	146776.9	488.52662
2010	9	448	146810.3667	490.66193
2010	9	449	146830.3	491.93849
2010	9	450	146838.8667	492.4882
2010	9	451	146859	493.78273
2010	9	452	146885.5333	495.49431
2010	9	453	146906.2667	496.83617
2010	9	454	146912	497.20791
2010	9	455	146912.0667	497.21224
2010	9	456	146932.3667	498.53088
2010	9	457	146942.3667	499.18183
2010	9	458	146948.7333	499.59674
2010	9	459	146964.2333	500.6084

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	460	146971.4	501.0769
2010	9	461	146981.9	501.76415
2010	9	462	146994.8	502.60986
2010	9	463	147017.4667	504.09956
2010	9	464	147030.3667	504.94947
2010	9	465	147030.9	504.98464
2010	9	466	147031.6333	505.03301
2010	9	467	147065.8	507.29187
2010	9	468	147065.8	507.29187
2010	9	469	147068.6	507.47747
2010	9	470	147072.1667	507.71398
2010	9	471	147072.2	507.7162
2010	9	472	147072.9	507.76263
2010	9	473	147074.3333	507.85772
2010	9	474	147075.0333	507.90417
2010	9	475	147075.0667	507.90638
2010	9	476	147075.0667	507.90638
2010	9	477	147075.1	507.90859
2010	9	478	147076.5	508.0015
2010	9	479	147106.6333	510.00564
2010	9	480	147121.9	511.02423
2010	9	481	147125.0667	511.23578
2010	9	482	147132.8667	511.75726
2010	9	483	147140.7333	512.28378
2010	9	484	147148.5667	512.80863
2010	9	485	147158.3333	513.46383
2010	9	486	147178.2	514.79935
2010	9	487	147191.0667	515.66627
2010	9	488	147204.7	516.58655
2010	9	489	147220.4667	517.65301
2010	9	490	147239.3333	518.93225
2010	9	491	147269.9	521.01194
2010	9	492	147284.3	521.99476
2010	9	493	147304.1	523.34936
2010	9	494	147321.3667	524.5337
2010	9	495	147328.3333	525.01236
2010	9	496	147332.8333	525.32179
2010	9	497	147374.5333	528.19842
2010	9	498	147385.5667	528.96235
2010	9	499	147389.9333	529.26501
2010	9	500	147406.3	530.40106
2010	9	501	147408.2667	530.53775
2010	9	502	147419.2333	531.30063
2010	9	503	147431.4667	532.153
2010	9	504	147459.5333	534.11409
2010	9	505	147467.2	534.65111
2010	9	506	147482.2333	535.70581
2010	9	507	147496.4667	536.70642
2010	9	508	147504.1333	537.24622
2010	9	509	147513.6667	537.91825
2010	9	510	147522.4	538.53467

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	511	147545.1	540.1404
2010	9	512	147547.5	540.31046
2010	9	513	147553.1	540.70751
2010	9	514	147564.1667	541.49305
2010	9	515	147571.2	541.99293
2010	9	516	147590.5	543.36714
2010	9	517	147592.1	543.48123
2010	9	518	147602.9333	544.25439
2010	9	519	147617.1333	545.2696
2010	9	520	147625.7667	545.8878
2010	9	521	147629.7333	546.1721
2010	9	522	147636.9333	546.68852
2010	9	523	147640.8	546.96607
2010	9	524	147665.8333	548.76662
2010	9	525	147667.4333	548.88191
2010	9	526	147680.7667	549.8437
2010	9	527	147689.5667	550.47947
2010	9	528	147698.3667	551.11601
2010	9	529	147719.8667	552.67449
2010	9	530	147724.8	553.03275
2010	9	531	147739.6667	554.11388
2010	9	532	147739.7	554.1163
2010	9	533	147743.0333	554.35902
2010	9	534	147750.7	554.91768
2010	9	535	147754.0667	555.1632
2010	9	536	147757.4333	555.40883
2010	9	537	147781.3333	557.1559
2010	9	538	147791.3333	557.88861
2010	9	539	147795.5	558.19421
2010	9	540	147795.5333	558.19666
2010	9	541	147796.5667	558.27248
2010	9	542	147799.6667	558.49999
2010	9	543	147803.0333	558.74719
2010	9	544	147808.4667	559.14638
2010	9	545	147808.4667	559.14638
2010	9	546	147812.8333	559.46742
2010	9	547	147822.8333	560.20336
2010	9	548	147823.9333	560.28437
2010	9	549	147823.9333	560.28437
2010	9	550	147833.1667	560.96491
2010	9	551	147837.3	561.26984
2010	9	552	147837.3333	561.2723
2010	9	553	147837.3667	561.27476
2010	9	554	147837.3667	561.27476
2010	9	555	147837.3667	561.27476
2010	9	556	147894.4333	565.50277
2010	9	557	147897.8	565.75325
2010	9	558	147900.9	565.984
2010	9	559	147902.2	566.0808
2010	9	560	147902.2333	566.08328
2010	9	561	147905.3667	566.31665

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	562	147905.3667	566.31665
2010	9	563	147906.4	566.39364
2010	9	564	147906.4333	566.39612
2010	9	565	147906.4667	566.39861
2010	9	566	147906.4667	566.39861
2010	9	567	147906.4667	566.39861
2010	9	568	147906.5	566.40109
2010	9	569	147906.5333	566.40358
2010	9	570	147906.5333	566.40358
2010	9	571	147907.5667	566.48057
2010	9	572	147907.6	566.48306
2010	9	573	147907.6333	566.48554
2010	9	574	147907.6333	566.48554
2010	9	575	147907.6333	566.48554
2010	9	576	147907.6333	566.48554
2010	9	577	147907.7	566.49051
2010	9	578	147907.7	566.49051
2010	9	579	147907.7	566.49051
2010	9	580	147926.4333	567.88837
2010	9	581	147927.9	567.99797
2010	9	582	147927.9333	568.00046
2010	9	583	147927.9333	568.00046
2010	9	584	147928.3333	568.03035
2010	9	585	147928.3333	568.03035
2010	9	586	147929.8	568.13998
2010	9	587	147931.4333	568.26209
2010	9	588	147931.4333	568.26209
2010	9	589	147934.5333	568.49392
2010	9	590	147936.5333	568.64354
2010	9	591	147941.4333	569.0103
2010	9	592	147956.8667	570.16708
2010	9	593	147958.5	570.28965
2010	9	594	147960.5333	570.44227
2010	9	595	147964.1667	570.71511
2010	9	596	147966.1667	570.86535
2010	9	597	147966.2	570.86785
2010	9	598	147968.9333	571.07325
2010	9	599	147970.5667	571.19603
2010	9	600	147973.8333	571.44166
2010	9	601	147974.2	571.46924
2010	9	602	147979.1	571.83792
2010	9	603	147979.4667	571.86552
2010	9	604	147979.8333	571.89312
2010	9	605	147979.8333	571.89312
2010	9	606	147980.9333	571.97593
2010	9	607	147980.9667	571.97844
2010	9	608	147981.3333	572.00605
2010	9	609	147981.3333	572.00605
2010	9	610	147981.3667	572.00856
2010	9	611	147981.3667	572.00856
2010	9	612	147981.3667	572.00856

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	613	147984.6333	572.25456
2010	9	614	147984.6333	572.25456
2010	9	615	147984.6333	572.25456
2010	9	616	147986.6333	572.40523
2010	9	617	147986.6333	572.40523
2010	9	618	147986.6333	572.40523
2010	9	619	147986.6333	572.40523
2010	9	620	147986.6667	572.40775
2010	9	621	147986.6667	572.40775
2010	9	622	147986.6667	572.40775
2010	9	623	147986.7	572.41026
2010	9	624	147986.7	572.41026
2010	9	625	147986.7	572.41026
2010	9	626	147986.7	572.41026
2010	9	627	147986.7	572.41026
2010	9	628	147986.7	572.41026
2010	9	629	147986.7	572.41026
2010	9	630	147986.7	572.41026
2010	9	631	147986.7	572.41026
2010	9	632	147986.7	572.41026
2010	9	633	147986.7333	572.41277
2010	9	634	147986.7333	572.41277
2010	9	635	147986.7333	572.41277
2010	9	636	147986.7667	572.41528
2010	9	637	147986.7667	572.41528
2010	9	638	147990.5	572.69665
2010	9	639	147990.5	572.69665
2010	9	640	147994.2333	572.97817
2010	9	641	147995.1667	573.04857
2010	9	642	147995.1667	573.04857
2010	9	643	147997.9667	573.25983
2010	9	644	147997.9667	573.25983
2010	9	645	147998.9	573.33027
2010	9	646	147999.8667	573.40323
2010	9	647	147999.8667	573.40323
2010	9	648	148000.8	573.47369
2010	9	649	148000.8333	573.47621
2010	9	650	148001.7667	573.54667
2010	9	651	148001.7667	573.54667
2010	9	652	148002.7	573.61715
2010	9	653	148004.5667	573.75813
2010	9	654	148007.3667	573.96967
2010	9	655	148007.3667	573.96967
2010	9	656	148007.3667	573.96967
2010	9	657	148009.3667	574.12082
2010	9	658	148009.3667	574.12082
2010	9	659	148009.4	574.12334
2010	9	660	148012.3333	574.3451
2010	9	661	148013.7667	574.4535
2010	9	662	148013.8	574.45602
2010	9	663	148015.7333	574.60226

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	664	148015.7333	574.60226
2010	9	665	148019.0333	574.85197
2010	9	666	148019.5333	574.88981
2010	9	667	148071.8	578.86045
2010	9	668	148073.2333	578.96974
2010	9	669	148073.2333	578.96974
2010	9	670	148073.7333	579.00788
2010	9	671	148073.7333	579.00788
2010	9	672	148074.2667	579.04855
2010	9	673	148074.7667	579.08669
2010	9	674	148076.2667	579.20112
2010	9	675	148076.8	579.24181
2010	9	676	148076.8	579.24181
2010	9	677	148077.7333	579.31303
2010	9	678	148077.7333	579.31303
2010	9	679	148077.7333	579.31303
2010	9	680	148077.7333	579.31303
2010	9	681	148078.2333	579.35118
2010	9	682	148078.7333	579.38934
2010	9	683	148078.7333	579.38934
2010	9	684	148078.7333	579.38934
2010	9	685	148079.2333	579.4275
2010	9	686	148080.2333	579.50383
2010	9	687	148080.2333	579.50383
2010	9	688	148080.2333	579.50383
2010	9	689	148080.2333	579.50383
2010	9	690	148080.2333	579.50383
2010	9	691	148080.2333	579.50383
2010	9	692	148080.2333	579.50383
2010	9	693	148080.2333	579.50383
2010	9	694	148080.2333	579.50383
2010	9	695	148080.2333	579.50383
2010	9	696	148080.2333	579.50383
2010	9	697	148080.2333	579.50383
2010	9	698	148080.2333	579.50383
2010	9	699	148080.7333	579.542
2010	9	700	148080.7333	579.542
2010	9	701	148080.7333	579.542
2010	9	702	148080.7333	579.542
2010	9	703	148080.7333	579.542
2010	9	704	148080.7333	579.542
2010	9	705	148080.7333	579.542
2010	9	706	148080.7333	579.542
2010	9	707	148080.7333	579.542
2010	9	708	148080.7333	579.542
2010	9	709	148080.7333	579.542
2010	9	710	148080.7333	579.542
2010	9	711	148081.1333	579.57254
2010	9	712	148081.1333	579.57254
2010	9	713	148081.1333	579.57254
2010	9	714	148081.7333	579.61835

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	715	148081.7333	579.61835
2010	9	716	148081.7333	579.61835
2010	9	717	148081.9333	579.63362
2010	9	718	148081.9333	579.63362
2010	9	719	148082.7333	579.6947
2010	9	720	148082.7333	579.6947
2010	9	721	148082.7333	579.6947
2010	9	722	148125.2	582.94716
2010	9	723	148125.2	582.94716
2010	9	724	148125.6	582.97789
2010	9	725	148125.6	582.97789
2010	9	726	148126.4	583.03935
2010	9	727	148126.6	583.05472
2010	9	728	148127	583.08545
2010	9	729	148127	583.08545
2010	9	730	148127	583.08545
2010	9	731	148127.2	583.10082
2010	9	732	148127.2	583.10082
2010	9	733	148127.2	583.10082
2010	9	734	148127.2	583.10082
2010	9	735	148127.2	583.10082
2010	9	736	148127.2	583.10082
2010	9	737	148128.2	583.17766
2010	9	738	148128.2	583.17766
2010	9	739	148128.4	583.19303
2010	9	740	148128.4	583.19303
2010	9	741	148128.4	583.19303
2010	9	742	148128.4	583.19303
2010	9	743	148128.4	583.19303
2010	9	744	148128.4	583.19303
2010	9	745	148131.5667	583.43644
2010	9	746	148131.5667	583.43644
2010	9	747	148131.5667	583.43644
2010	9	748	148134.6667	583.67483
2010	9	749	148140.9333	584.15705
2010	9	750	148140.9333	584.15705
2010	9	751	148141.3333	584.18785
2010	9	752	148141.3333	584.18785
2010	9	753	148141.3333	584.18785
2010	9	754	148141.3333	584.18785
2010	9	755	148141.3333	584.18785
2010	9	756	148144.3	584.41629
2010	9	757	148150.3667	584.88375
2010	9	758	148194.2333	588.27558
2010	9	759	148194.2333	588.27558
2010	9	760	148194.2333	588.27558
2010	9	761	148244.6667	592.20088
2010	9	762	148247.7	592.43784
2010	9	763	148253.8333	592.9173
2010	9	764	148256.8667	593.15457
2010	9	765	148259.5667	593.36585

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	766	148271.7	594.3163
2010	9	767	148271.7	594.3163
2010	9	768	148271.7	594.3163
2010	9	769	148271.7	594.3163
2010	9	770	148271.7	594.3163
2010	9	771	148271.7	594.3163
2010	9	772	148271.7	594.3163
2010	9	773	148271.7	594.3163
2010	9	774	148271.7	594.3163
2010	9	775	148271.7	594.3163
2010	9	776	148271.7	594.3163
2010	9	777	148271.7	594.3163
2010	9	778	148296.2333	596.24301
2010	9	779	148296.2333	596.24301
2010	9	780	148296.2333	596.24301
2010	9	781	148296.2333	596.24301
2010	9	782	148296.2333	596.24301
2010	9	783	148296.2333	596.24301
2010	9	784	148296.2333	596.24301
2010	9	785	148296.2333	596.24301
2010	9	786	148296.2333	596.24301
2010	9	787	148296.2333	596.24301
2010	9	788	148296.2333	596.24301
2010	9	789	148296.2333	596.24301
2010	9	790	148296.2333	596.24301
2010	9	791	148296.2333	596.24301
2010	9	792	148296.2333	596.24301
2010	9	793	148327.2333	598.68701
2010	9	794	148327.2333	598.68701
2010	9	795	148327.2333	598.68701
2010	9	796	148327.2333	598.68701
2010	9	797	148327.2333	598.68701
2010	9	798	148327.2333	598.68701
2010	9	799	148327.2333	598.68701
2010	9	800	148327.2333	598.68701
2010	9	801	148327.2333	598.68701
2010	9	802	148327.2333	598.68701
2010	9	803	148327.2333	598.68701
2010	9	804	148327.2333	598.68701
2010	9	805	148327.2333	598.68701
2010	9	806	148327.2333	598.68701
2010	9	807	148327.2333	598.68701
2010	9	808	148327.2333	598.68701
2010	9	809	148327.2333	598.68701
2010	9	810	148327.2333	598.68701
2010	9	811	148327.2333	598.68701
2010	9	812	148327.2333	598.68701
2010	9	813	148327.2333	598.68701
2010	9	814	148327.2333	598.68701
2010	9	815	148327.2333	598.68701
2010	9	816	148327.2333	598.68701

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	817	148327.2333	598.68701
2010	9	818	148327.2333	598.68701
2010	9	819	148327.2333	598.68701
2010	9	820	148327.2333	598.68701
2010	9	821	148328.8333	598.81344
2010	9	822	148328.8333	598.81344
2010	9	823	148332.0333	599.06638
2010	9	824	148351.2333	600.58641
2010	9	825	148352.8333	600.71326
2010	9	826	148357.6333	601.09399
2010	9	827	148359.2333	601.22095
2010	9	828	148359.2333	601.22095
2010	9	829	148364.0333	601.60202
2010	9	830	148368.9	601.98864
2010	9	831	148383.5	603.15008
2010	9	832	148419.4333	606.01867
2010	9	833	148424.3333	606.41096
2010	9	834	148455.8667	608.94189
2010	9	835	148464.0333	609.59918
2010	9	836	148467.3	609.8623
2010	9	837	148477.0333	610.64702
2010	9	838	148480.3	610.91062
2010	9	839	148488.4667	611.57015
2010	9	840	148490.0667	611.69945
2010	9	841	148490.0667	611.69945
2010	9	842	148490.0667	611.69945
2010	9	843	148490.0667	611.69945
2010	9	844	148493.3333	611.96353
2010	9	845	148496.6	612.22774
2010	9	846	148496.6	612.22774
2010	9	847	148496.6	612.22774
2010	9	848	148499.8667	612.49206
2010	9	849	148499.8667	612.49206
2010	9	850	148499.8667	612.49206
2010	9	851	148499.8667	612.49206
2010	9	852	148499.8667	612.49206
2010	9	853	148499.8667	612.49206
2010	9	854	148499.8667	612.49206
2010	9	855	148499.8667	612.49206
2010	9	856	148501.5667	612.62966
2010	9	857	148508.3667	613.1804
2010	9	858	148513.4667	613.5938
2010	9	859	148518.5667	614.00749
2010	9	860	148528.7667	614.83575
2010	9	861	148545.2	616.17265
2010	9	862	148546.9	616.31113
2010	9	863	148557.6667	617.1889
2010	9	864	148557.6667	617.1889
2010	9	865	148564.4667	617.74396
2010	9	866	148568.4333	618.06799
2010	9	867	148574.1	618.5312

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	868	148580.3333	619.04115
2010	9	869	148587.1333	619.59797
2010	9	870	148589.4	619.78369
2010	9	871	148593.9333	620.15532
2010	9	872	148597.9	620.48068
2010	9	873	148600.1667	620.66668
2010	9	874	148604.7	621.03886
2010	9	875	148607.5333	621.27159
2010	9	876	148608.6667	621.36471
2010	9	877	148612.0667	621.64416
2010	9	878	148613.7667	621.78393
2010	9	879	148616.3667	621.99776
2010	9	880	148625.9	622.78248
2010	9	881	148633.7	623.42529
2010	9	882	148639.1667	623.87623
2010	9	883	148660.4	625.631
2010	9	884	148666.4667	626.13332
2010	9	885	148686.9667	627.83386
2010	9	886	148688.7	627.97787
2010	9	887	148693.9	628.4101
2010	9	888	148699.9667	628.91477
2010	9	889	148732.5667	631.63399
2010	9	890	148769.9333	634.76605
2010	9	891	148773.8333	635.09388
2010	9	892	148777.3	635.38544
2010	9	893	148784.6667	636.00548
2010	9	894	148789	636.3705
2010	9	895	148794.2	636.80882
2010	9	896	148794.6333	636.84536
2010	9	897	148801.5667	637.43031
2010	9	898	148804.6	637.68641
2010	9	899	148805.0333	637.723
2010	9	900	148810.6667	638.19893
2010	9	901	148813.2667	638.41871
2010	9	902	148815	638.56527
2010	9	903	148815	638.56527
2010	9	904	148815	638.56527
2010	9	905	148815	638.56527
2010	9	906	148815	638.56527
2010	9	907	148815.8667	638.63857
2010	9	908	148815.8667	638.63857
2010	9	909	148815.8667	638.63857
2010	9	910	148815.8667	638.63857
2010	9	911	148816.3	638.67522
2010	9	912	148816.8667	638.72315
2010	9	913	148816.8667	638.72315
2010	9	914	148818.5667	638.86697
2010	9	915	148819.1333	638.91492
2010	9	916	148819.7	638.96287
2010	9	917	148822.5333	639.20268
2010	9	918	148823.1	639.25066

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	919	148825.9333	639.49058
2010	9	920	148825.9333	639.49058
2010	9	921	148827.0667	639.58658
2010	9	922	148827.0667	639.58658
2010	9	923	148828.2	639.68259
2010	9	924	148828.2	639.68259
2010	9	925	148829.3333	639.77862
2010	9	926	148829.3333	639.77862
2010	9	927	148829.3333	639.77862
2010	9	928	148830.4667	639.87466
2010	9	929	148830.4667	639.87466
2010	9	930	148831.0333	639.92269
2010	9	931	148831.0333	639.92269
2010	9	932	148832.1667	640.01875
2010	9	933	148832.1667	640.01875
2010	9	934	148832.1667	640.01875
2010	9	935	148832.7333	640.06679
2010	9	936	148832.7333	640.06679
2010	9	937	148833.3	640.11483
2010	9	938	148833.3	640.11483
2010	9	939	148833.3	640.11483
2010	9	940	148833.3	640.11483
2010	9	941	148833.3	640.11483
2010	9	942	148833.3	640.11483
2010	9	943	148833.3	640.11483
2010	9	944	148833.3	640.11483
2010	9	945	148879.5667	644.05015
2010	9	946	148879.5667	644.05015
2010	9	947	148879.5667	644.05015
2010	9	948	148879.5667	644.05015
2010	9	949	148879.5667	644.05015
2010	9	950	148879.5667	644.05015
2010	9	951	148879.5667	644.05015
2010	9	952	148879.5667	644.05015
2010	9	953	148879.5667	644.05015
2010	9	954	148879.5667	644.05015
2010	9	955	148879.5667	644.05015
2010	9	956	148879.5667	644.05015
2010	9	957	148879.5667	644.05015
2010	9	958	148879.5667	644.05015
2010	9	959	148879.5667	644.05015
2010	9	960	148879.5667	644.05015
2010	9	961	148879.5667	644.05015
2010	9	962	148879.5667	644.05015
2010	9	963	148879.5667	644.05015
2010	9	964	148879.5667	644.05015
2010	9	965	148879.5667	644.05015
2010	9	966	148879.5667	644.05015
2010	9	967	148879.5667	644.05015
2010	9	968	148879.5667	644.05015
2010	9	969	148879.5667	644.05015

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	9	970	148879.5667	644.05015
2010	9	971	148879.5667	644.05015
2010	9	972	148879.5667	644.05015
2010	9	973	148879.5667	644.05015
2010	9	974	148879.5667	644.05015
2010	9	975	148883.2	644.36027
2010	9	976	148883.2	644.36027
2010	9	977	148883.2	644.36027
2010	9	978	148883.2	644.36027
2010	9	979	148883.2	644.36027
2010	9	980	148883.2	644.36027
2010	9	981	148888.2	644.7873
2010	9	982	148888.2	644.7873
2010	9	983	148888.2	644.7873
2010	9	984	148888.2	644.7873
2010	9	985	148888.2	644.7873
2010	9	986	148888.2	644.7873
2010	9	987	148888.2	644.7873
2010	9	988	148888.2	644.7873
2010	9	989	148888.2	644.7873
2010	9	990	148888.2	644.7873
2010	9	991	148888.2	644.7873
2010	9	992	148888.2	644.7873
2010	9	993	148888.2	644.7873
2010	9	994	148888.2	644.7873
2010	9	995	148888.2	644.7873
2010	9	996	148888.2	644.7873
2010	9	997	148888.2	644.7873
2010	9	998	148937.2	648.98792
2010	9	999	148938.1333	649.06821

October 2010

Net Benefit Tab

Effective_month	Test_result
10/1/2010 0:00	\$38.10

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.998978318	1.079290369

Curve Parameters Tab

a	b	c	d
3.371231033	0.000160362	17.48919817	36.34845615

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	1	18205.09677	36.34846
2010	10	2	19084.41935	36.34846
2010	10	3	19230.19355	36.34846
2010	10	4	20148.45161	36.34846
2010	10	5	23955.58065	36.34846
2010	10	6	28544.74194	36.34846
2010	10	7	30742.09677	36.34846
2010	10	8	30755.74194	36.34846
2010	10	9	31611.45161	36.34846
2010	10	10	31705.03226	36.34846
2010	10	11	31840.48387	36.34846
2010	10	12	32119.03226	36.34846
2010	10	13	32501.48387	36.34846
2010	10	14	32669.35484	36.34846
2010	10	15	33923.93548	36.34846
2010	10	16	34108.32258	36.34846
2010	10	17	34471.06452	36.34846
2010	10	18	34748.12903	36.34846
2010	10	19	35272.19355	36.34846
2010	10	20	37015.35484	36.34846
2010	10	21	38121.19355	36.34846
2010	10	22	39408.64516	36.34846
2010	10	23	42000.96774	36.34846
2010	10	24	44514.06452	36.34846
2010	10	25	50771.80645	36.34847
2010	10	26	54496.09677	36.34848
2010	10	27	58993.93548	36.34852
2010	10	28	64191.06452	36.34861
2010	10	29	70402.12903	36.34898
2010	10	30	75845.74194	36.34995
2010	10	31	78538.77419	36.35098
2010	10	32	80488.35484	36.35214
2010	10	33	82382.67742	36.35378
2010	10	34	84242.51613	36.3561
2010	10	35	86058.25806	36.35934
2010	10	36	87360.83871	36.36248
2010	10	37	88380.12903	36.36555
2010	10	38	89807.03226	36.37102
2010	10	39	91023.90323	36.37704
2010	10	40	91941.67742	36.38262
2010	10	41	93280.80645	36.39278
2010	10	42	94030.96774	36.39974
2010	10	43	94982.25806	36.41016
2010	10	44	95718	36.41965
2010	10	45	97055.16129	36.44079
2010	10	46	98394.93548	36.46827
2010	10	47	99286.3871	36.49094
2010	10	48	100404.9677	36.52556
2010	10	49	101462.2258	36.56598
2010	10	50	102756.4839	36.62822
2010	10	51	103836.6129	36.69361

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	52	104650.6129	36.7528
2010	10	53	105363.1613	36.81289
2010	10	54	106022	36.87636
2010	10	55	107194.0645	37.01148
2010	10	56	107826.7097	37.09827
2010	10	57	108621.6129	37.2236
2010	10	58	109362.6129	37.35923
2010	10	59	109817	37.4526
2010	10	60	110405.6129	37.58649
2010	10	61	111066.7419	37.75633
2010	10	62	112052.3226	38.05372
2010	10	63	112598.7419	38.24487
2010	10	64	113275	38.51138
2010	10	65	113820.6452	38.75347
2010	10	66	114498.1613	39.09213
2010	10	67	115074.9032	39.41773
2010	10	68	115573.0323	39.72989
2010	10	69	116110.0323	40.10206
2010	10	70	116627.8065	40.49964
2010	10	71	117178.4194	40.96875
2010	10	72	117462.8387	41.23146
2010	10	73	117887.4839	41.65177
2010	10	74	118227.4194	42.01415
2010	10	75	118724.1613	42.58869
2010	10	76	119088.0645	43.04624
2010	10	77	119440.8065	43.52176
2010	10	78	119661.2258	43.83588
2010	10	79	119917.9032	44.21906
2010	10	80	120064.1613	44.44611
2010	10	81	120258.6129	44.75814
2010	10	82	120449.4194	45.07601
2010	10	83	120719.0968	45.54587
2010	10	84	120880.871	45.83978
2010	10	85	121139.3871	46.32908
2010	10	86	121332.3226	46.71062
2010	10	87	121429.7742	46.90884
2010	10	88	121524.9032	47.106
2010	10	89	121614.6129	47.29529
2010	10	90	121824.0645	47.75032
2010	10	91	121959.5161	48.05461
2010	10	92	122163.5484	48.52837
2010	10	93	122284.6129	48.81849
2010	10	94	122369.6129	49.0263
2010	10	95	122483.3226	49.30973
2010	10	96	122601.2581	49.61039
2010	10	97	122695.3871	49.85536
2010	10	98	122853.7419	50.27772
2010	10	99	122929.2581	50.48377
2010	10	100	122983.2581	50.63297
2010	10	101	123217.9677	51.29999
2010	10	102	123370.3226	51.74955

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	103	123570.4839	52.36078
2010	10	104	123720.5806	52.83499
2010	10	105	123977	53.67784
2010	10	106	124148.3226	54.26485
2010	10	107	124290.0968	54.76563
2010	10	108	124451.3871	55.35238
2010	10	109	124661.4516	56.14468
2010	10	110	124867.4839	56.95385
2010	10	111	125106.3548	57.93349
2010	10	112	125390.0323	59.15756
2010	10	113	125546.5806	59.86254
2010	10	114	125653.7097	60.35749
2010	10	115	125833.6452	61.21238
2010	10	116	125963	61.84569
2010	10	117	126108.4194	62.57694
2010	10	118	126235.1935	63.23152
2010	10	119	126548.129	64.91811
2010	10	120	126721.4194	65.89718
2010	10	121	126870.2581	66.76484
2010	10	122	127006.2258	67.57972
2010	10	123	127154.0645	68.49053
2010	10	124	127342	69.68683
2010	10	125	127645.129	71.71091
2010	10	126	127771.9032	72.59345
2010	10	127	128035.7097	74.50117
2010	10	128	128220.3548	75.89587
2010	10	129	128365.2903	77.02624
2010	10	130	128576.2258	78.72934
2010	10	131	128750.8065	80.19271
2010	10	132	128939.4516	81.83082
2010	10	133	129088.3871	83.16723
2010	10	134	129214.0968	84.32575
2010	10	135	129359.5484	85.70202
2010	10	136	129484.129	86.91216
2010	10	137	129693.3871	89.01198
2010	10	138	129779.5484	89.90172
2010	10	139	129874.9355	90.90427
2010	10	140	130027.7419	92.54957
2010	10	141	130213.8065	94.62011
2010	10	142	130326.7742	95.91427
2010	10	143	130431.4839	97.13947
2010	10	144	130514.2258	98.12543
2010	10	145	130641.0323	99.66759
2010	10	146	130807.7742	101.75417
2010	10	147	130942.0323	103.48411
2010	10	148	131053.5161	104.95533
2010	10	149	131258.5484	107.74576
2010	10	150	131804.8065	115.74676
2010	10	151	131926.8387	117.65329
2010	10	152	132018.5484	119.11616
2010	10	153	132127.2581	120.88432

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	154	132193.4194	121.97888
2010	10	155	132292.7742	123.64925
2010	10	156	132321	124.12971
2010	10	157	132352.4194	124.66763
2010	10	158	132394.1935	125.38795
2010	10	159	132421.0645	125.85439
2010	10	160	132696.1613	130.77252
2010	10	161	132838.6129	133.42453
2010	10	162	132876.3226	134.13895
2010	10	163	132916.2903	134.90189
2010	10	164	132938.0645	135.32003
2010	10	165	132989.5484	136.31579
2010	10	166	133010.4839	136.72357
2010	10	167	133039.2903	137.28737
2010	10	168	133090.9677	138.30676
2010	10	169	133131.2903	139.1093
2010	10	170	133192.9677	140.34912
2010	10	171	133264.1613	141.79883
2010	10	172	133280.3226	142.13072
2010	10	173	133316.8065	142.88382
2010	10	174	133341.7419	143.40162
2010	10	175	133381.2903	144.22803
2010	10	176	133422.4516	145.09491
2010	10	177	133448.5806	145.64882
2010	10	178	133491.6774	146.5686
2010	10	179	133532.2581	147.44175
2010	10	180	133656.871	150.16645
2010	10	181	133677.6452	150.62714
2010	10	182	133708.7419	151.32023
2010	10	183	133742.6452	152.08066
2010	10	184	133836.2258	154.20583
2010	10	185	133851.0323	154.54564
2010	10	186	133880.5484	155.22595
2010	10	187	133902.0645	155.72434
2010	10	188	133918.7742	156.11283
2010	10	189	133933.5806	156.45814
2010	10	190	134001.7419	158.06062
2010	10	191	134018.0645	158.44752
2010	10	192	134076.5806	159.84472
2010	10	193	134124.0323	160.98945
2010	10	194	134135.8387	161.27592
2010	10	195	134163.6129	161.95242
2010	10	196	134184.1613	162.45528
2010	10	197	134207.8387	163.0372
2010	10	198	134226.5484	163.49894
2010	10	199	134256.2581	164.2356
2010	10	200	134269.1935	164.55767
2010	10	201	134295.8065	165.22283
2010	10	202	134319.3548	165.81428
2010	10	203	134329.8387	166.07847
2010	10	204	134349.3226	166.57089

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	205	134379.2258	167.33028
2010	10	206	134411.7419	168.16105
2010	10	207	134433.7742	168.72695
2010	10	208	134488.3548	170.13935
2010	10	209	134569.2258	172.25983
2010	10	210	134600.4194	173.08669
2010	10	211	134649	174.38447
2010	10	212	134668.0645	174.89712
2010	10	213	134690.2581	175.49631
2010	10	214	134725.1935	176.44476
2010	10	215	134762.3871	177.46162
2010	10	216	134784.4839	178.06923
2010	10	217	134836.4839	179.50945
2010	10	218	134863.3548	180.25941
2010	10	219	134886.0323	180.89539
2010	10	220	135508.7742	199.5022
2010	10	221	135522.3548	199.93361
2010	10	222	135542.3871	200.57204
2010	10	223	135566.3871	201.34021
2010	10	224	135569.3548	201.43545
2010	10	225	135909.3226	212.71728
2010	10	226	135915	212.91209
2010	10	227	135915.3871	212.92538
2010	10	228	135916.7097	212.9708
2010	10	229	135916.871	212.97634
2010	10	230	135917.5484	212.9996
2010	10	231	135943.3871	213.88937
2010	10	232	135948.5484	214.06763
2010	10	233	135959.9677	214.46269
2010	10	234	135970.5806	214.83062
2010	10	235	136041.4194	217.30608
2010	10	236	136051.871	217.67421
2010	10	237	136076.5161	218.54523
2010	10	238	136096.4839	219.254
2010	10	239	136097.6774	219.29646
2010	10	240	136136.2258	220.6729
2010	10	241	136141.2258	220.85219
2010	10	242	136158.1935	221.46193
2010	10	243	136170.1935	221.89436
2010	10	244	136184.9677	222.42816
2010	10	245	136191.0968	222.65005
2010	10	246	136246.9677	224.68503
2010	10	247	136285.0968	226.08654
2010	10	248	136297.7097	226.55245
2010	10	249	136313.5484	227.13913
2010	10	250	136320.2581	227.38821
2010	10	251	136341.9032	228.19395
2010	10	252	136361.129	228.91248
2010	10	253	136366.6452	229.11913
2010	10	254	136398.3871	230.3126
2010	10	255	136404.7742	230.55364

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	256	136452.4839	232.36364
2010	10	257	136473.5806	233.16937
2010	10	258	136490.2581	233.80867
2010	10	259	136502.7097	234.28733
2010	10	260	136521.8065	235.02369
2010	10	261	136535.4194	235.55027
2010	10	262	136576.2903	237.13966
2010	10	263	136597	237.94986
2010	10	264	136615.3871	238.67193
2010	10	265	136637.1935	239.53163
2010	10	266	136663.2581	240.56399
2010	10	267	136711.0645	242.47117
2010	10	268	136740.1935	243.64196
2010	10	269	136769.4839	244.82593
2010	10	270	136815.2258	246.68846
2010	10	271	136887.7097	249.674
2010	10	272	136992.5806	254.0687
2010	10	273	137021.2903	255.28751
2010	10	274	137043.871	256.25091
2010	10	275	137064.0968	257.11745
2010	10	276	137088.3548	258.16124
2010	10	277	137106.6774	258.95291
2010	10	278	137176.3871	261.99078
2010	10	279	137201.5161	263.09601
2010	10	280	137210.8065	263.50599
2010	10	281	137224.5161	264.11235
2010	10	282	137242.4839	264.90948
2010	10	283	137333.6774	268.99849
2010	10	284	137350.8387	269.77612
2010	10	285	137385.2581	271.34361
2010	10	286	137410.0968	272.48133
2010	10	287	137432.4839	273.51146
2010	10	288	137484.0645	275.90207
2010	10	289	137519.1613	277.54247
2010	10	290	137585.1935	280.65927
2010	10	291	137630.0645	282.80019
2010	10	292	137660.7097	284.27312
2010	10	293	137690.5806	285.71732
2010	10	294	137730.0968	287.64078
2010	10	295	137763.4516	289.27587
2010	10	296	137792.871	290.72687
2010	10	297	137822.2258	292.18298
2010	10	298	137867.5806	294.44917
2010	10	299	137884.2581	295.2875
2010	10	300	138252.8065	314.5247
2010	10	301	138275.6129	315.76104
2010	10	302	138322.0968	318.29796
2010	10	303	138341.7097	319.37527
2010	10	304	138370.4516	320.96145
2010	10	305	138395.7419	322.3645
2010	10	306	138424.4839	323.96743

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	307	138435.129	324.56339
2010	10	308	138453.4839	325.59387
2010	10	309	138480.4516	327.11458
2010	10	310	138500.7742	328.26584
2010	10	311	138521.5484	329.44741
2010	10	312	138546.5484	330.87566
2010	10	313	138586.129	333.15116
2010	10	314	138630.1613	335.70324
2010	10	315	138647.0645	336.68876
2010	10	316	138687.6452	339.06803
2010	10	317	138723.2903	341.17347
2010	10	318	138743.129	342.35161
2010	10	319	138777	344.3736
2010	10	320	138799.7097	345.73678
2010	10	321	138816.0968	346.72418
2010	10	322	138846.9355	348.59091
2010	10	323	138912	352.56632
2010	10	324	138925.1935	353.37859
2010	10	325	138939.7097	354.2747
2010	10	326	138978.2581	356.66668
2010	10	327	139015.871	359.01795
2010	10	328	139046.4839	360.94437
2010	10	329	139081.129	363.13841
2010	10	330	139134.2258	366.52979
2010	10	331	139148.6129	367.45477
2010	10	332	139226.6452	372.51693
2010	10	333	139245.3548	373.74213
2010	10	334	139281.0968	376.09513
2010	10	335	139302.8065	377.53234
2010	10	336	139324	378.94125
2010	10	337	139339.9032	380.00229
2010	10	338	139371	382.08652
2010	10	339	139375.7097	382.40328
2010	10	340	139384.1613	382.97244
2010	10	341	139401.0323	384.1114
2010	10	342	139537.3226	393.45063
2010	10	343	139549.3871	394.28933
2010	10	344	139565.1613	395.3889
2010	10	345	139591.5484	397.2358
2010	10	346	139605.5161	398.21729
2010	10	347	139614.6774	398.86248
2010	10	348	139643.0645	400.86899
2010	10	349	139653.8065	401.63116
2010	10	350	139668.5806	402.68204
2010	10	351	139678.5806	403.39505
2010	10	352	139713.4839	405.89457
2010	10	353	139728.2258	406.95539
2010	10	354	139872.4839	417.49815
2010	10	355	139889.1935	418.73856
2010	10	356	139905.2903	419.93729
2010	10	357	139984.8065	425.91423

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	358	140018.9677	428.51052
2010	10	359	140039.3871	430.07067
2010	10	360	140066.8387	432.1779
2010	10	361	140095.7419	434.40876
2010	10	362	140117.3871	436.08764
2010	10	363	140142.7419	438.06326
2010	10	364	140167	439.96256
2010	10	365	140195.5161	442.20674
2010	10	366	140226.4839	444.65799
2010	10	367	140248.4516	446.40582
2010	10	368	140271.6774	448.26188
2010	10	369	140287.1613	449.50392
2010	10	370	140308.6774	451.23605
2010	10	371	140315.4194	451.7803
2010	10	372	140332.8065	453.18718
2010	10	373	140342.5484	453.97753
2010	10	374	140409.9032	459.4831
2010	10	375	140416.7742	460.04879
2010	10	376	140427.8387	460.96134
2010	10	377	140431.2581	461.24375
2010	10	378	140436.9677	461.71573
2010	10	379	140441.871	462.12147
2010	10	380	140447	462.54631
2010	10	381	140456.4194	463.32763
2010	10	382	140471.0645	464.54526
2010	10	383	140486.129	465.80137
2010	10	384	140568.6452	472.74744
2010	10	385	140613.2258	476.54679
2010	10	386	140623.0645	477.38973
2010	10	387	140670.3226	481.46117
2010	10	388	140674.9032	481.8578
2010	10	389	140700.0968	484.04559
2010	10	390	140715	485.34483
2010	10	391	140723.6774	486.10305
2010	10	392	140835.8387	496.01955
2010	10	393	140840.4516	496.43204
2010	10	394	140845.7097	496.90267
2010	10	395	140878.0323	499.80635
2010	10	396	140879.2903	499.91973
2010	10	397	140885.4839	500.47835
2010	10	398	140885.4839	500.47835
2010	10	399	140885.9032	500.5162
2010	10	400	140887.3548	500.64723
2010	10	401	140887.7419	500.68218
2010	10	402	140888.129	500.71713
2010	10	403	140888.5484	500.755
2010	10	404	140888.9677	500.79287
2010	10	405	140888.9677	500.79287
2010	10	406	140982.7097	509.3362
2010	10	407	140982.7097	509.3362
2010	10	408	140982.7097	509.3362

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	409	140982.7097	509.3362
2010	10	410	140982.7097	509.3362
2010	10	411	140982.7419	509.33917
2010	10	412	140982.7742	509.34213
2010	10	413	140982.8065	509.3451
2010	10	414	140982.8065	509.3451
2010	10	415	140982.8065	509.3451
2010	10	416	140990.0968	510.01608
2010	10	417	141008.0968	511.67682
2010	10	418	141008.0968	511.67682
2010	10	419	141008.0968	511.67682
2010	10	420	141008.0968	511.67682
2010	10	421	141008.129	511.6798
2010	10	422	141008.129	511.6798
2010	10	423	141008.8065	511.74242
2010	10	424	141013.7742	512.20185
2010	10	425	141013.7742	512.20185
2010	10	426	141013.7742	512.20185
2010	10	427	141052.7742	515.82412
2010	10	428	141052.7742	515.82412
2010	10	429	141052.7742	515.82412
2010	10	430	141070.7742	517.50522
2010	10	431	141070.7742	517.50522
2010	10	432	141070.8065	517.50824
2010	10	433	141075.7419	517.97022
2010	10	434	141080.6774	518.43264
2010	10	435	141090.4839	519.35276
2010	10	436	141110	521.18915
2010	10	437	141110	521.18915
2010	10	438	141110	521.18915
2010	10	439	141136.6452	523.70763
2010	10	440	141136.6452	523.70763
2010	10	441	141141.6452	524.18169
2010	10	442	141142.3226	524.24595
2010	10	443	141147.9677	524.78179
2010	10	444	141150.6774	525.03921
2010	10	445	141170.4194	526.91875
2010	10	446	141170.4194	526.91875
2010	10	447	141170.6774	526.94337
2010	10	448	141170.7097	526.94645
2010	10	449	141204.3226	530.16342
2010	10	450	141216.5806	531.34184
2010	10	451	141230.3871	532.67248
2010	10	452	141235.2581	533.14279
2010	10	453	141235.2581	533.14279
2010	10	454	141235.9355	533.20823
2010	10	455	141240.871	533.68528
2010	10	456	141250.7419	534.64076
2010	10	457	141276	537.09404
2010	10	458	141276	537.09404
2010	10	459	141278.0323	537.29196

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	460	141303.0323	539.73303
2010	10	461	141304.0968	539.83723
2010	10	462	141308.6452	540.28272
2010	10	463	141313.0968	540.71911
2010	10	464	141315.1935	540.92479
2010	10	465	141316.3226	541.03557
2010	10	466	141318.9032	541.28888
2010	10	467	141325.2903	541.91638
2010	10	468	141333.5161	542.72566
2010	10	469	141343.0645	543.66669
2010	10	470	141354.4516	544.79122
2010	10	471	141362.7097	545.6083
2010	10	472	141372.2258	546.55148
2010	10	473	141378.3226	547.15668
2010	10	474	141385.1613	547.83638
2010	10	475	141392.0968	548.52662
2010	10	476	141399.1935	549.23387
2010	10	477	141407.4194	550.05487
2010	10	478	141427.9677	552.1115
2010	10	479	141435.6452	552.88202
2010	10	480	141443.4516	553.66668
2010	10	481	141449.7742	554.30305
2010	10	482	141460.5161	555.38604
2010	10	483	141493.3871	558.71414
2010	10	484	141503.3871	559.73084
2010	10	485	141517.5484	561.174
2010	10	486	141529.0645	562.35053
2010	10	487	141540.4194	563.51317
2010	10	488	141545.9032	564.07559
2010	10	489	141560	565.52409
2010	10	490	141562.4839	565.77973
2010	10	491	141564.7419	566.01224
2010	10	492	141568.7742	566.42768
2010	10	493	141575.2258	567.09308
2010	10	494	141580.0968	567.596
2010	10	495	141587.0645	568.31624
2010	10	496	141589.3871	568.55654
2010	10	497	141598.4516	569.49541
2010	10	498	141602.0968	569.87343
2010	10	499	141604.129	570.0843
2010	10	500	141608.7742	570.5666
2010	10	501	141612.6452	570.96885
2010	10	502	141619.3548	571.6668
2010	10	503	141635.871	573.38872
2010	10	504	141638.871	573.70209
2010	10	505	141640.2258	573.84367
2010	10	506	141646.871	574.53862
2010	10	507	141656.6452	575.56245
2010	10	508	141680.6452	578.08466
2010	10	509	141684.2581	578.46537
2010	10	510	141690.0968	579.08119

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	511	141692.8065	579.36722
2010	10	512	141694.3548	579.53073
2010	10	513	141699.9032	580.11706
2010	10	514	141713.0645	581.51042
2010	10	515	141717.8065	582.01332
2010	10	516	141718.4839	582.0852
2010	10	517	141722.3548	582.49612
2010	10	518	141726.0645	582.89022
2010	10	519	141744.6129	584.86495
2010	10	520	141760.4516	586.55685
2010	10	521	141762	586.72253
2010	10	522	141765.7097	587.11967
2010	10	523	141769.9032	587.56896
2010	10	524	141788.2903	589.54325
2010	10	525	141799.9355	590.79728
2010	10	526	141803.1613	591.14517
2010	10	527	141812.9355	592.20058
2010	10	528	141821.8065	593.1602
2010	10	529	141833.7742	594.45745
2010	10	530	141842.129	595.36486
2010	10	531	141844.9355	595.67
2010	10	532	141863.1613	597.6557
2010	10	533	141877.5806	599.23168
2010	10	534	141927.1613	604.6845
2010	10	535	141942.7419	606.40893
2010	10	536	141951.2258	607.3501
2010	10	537	141954.7742	607.7442
2010	10	538	141961.7097	608.51529
2010	10	539	141965.0323	608.88506
2010	10	540	141966.0323	608.9964
2010	10	541	141970.8065	609.52824
2010	10	542	141982.8065	610.86723
2010	10	543	141982.8065	610.86723
2010	10	544	141986.0323	611.2277
2010	10	545	141994.2903	612.15154
2010	10	546	142008.3548	613.72839
2010	10	547	142009.9032	613.90225
2010	10	548	142012.7742	614.22475
2010	10	549	142017.4839	614.7542
2010	10	550	142017.4839	614.7542
2010	10	551	142028.6129	616.00721
2010	10	552	142028.6129	616.00721
2010	10	553	142028.6129	616.00721
2010	10	554	142032.8387	616.4837
2010	10	555	142054.9677	618.98533
2010	10	556	142072.9032	621.0208
2010	10	557	142077.6129	621.55647
2010	10	558	142077.6129	621.55647
2010	10	559	142092.5484	623.25845
2010	10	560	142098.6452	623.95464
2010	10	561	142118.6774	626.24792

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	562	142130.6774	627.62596
2010	10	563	142137.6129	628.42388
2010	10	564	142150.5161	629.91124
2010	10	565	142150.5161	629.91124
2010	10	566	142153.5161	630.25758
2010	10	567	142157.7419	630.74579
2010	10	568	142178.3226	633.12921
2010	10	569	142181.5484	633.50365
2010	10	570	142181.5484	633.50365
2010	10	571	142181.5484	633.50365
2010	10	572	142183.5484	633.73592
2010	10	573	142184.5484	633.85209
2010	10	574	142184.5484	633.85209
2010	10	575	142184.5484	633.85209
2010	10	576	142185.9032	634.00952
2010	10	577	142189.9032	634.47455
2010	10	578	142190.9677	634.59837
2010	10	579	142190.9677	634.59837
2010	10	580	142191.9677	634.71471
2010	10	581	142193.5484	634.89864
2010	10	582	142194.5484	635.01504
2010	10	583	142201.2258	635.79284
2010	10	584	142201.2258	635.79284
2010	10	585	142201.5806	635.8342
2010	10	586	142201.5806	635.8342
2010	10	587	142201.5806	635.8342
2010	10	588	142201.5806	635.8342
2010	10	589	142201.5806	635.8342
2010	10	590	142201.5806	635.8342
2010	10	591	142203.1613	636.01848
2010	10	592	142205.0968	636.24421
2010	10	593	142205.0968	636.24421
2010	10	594	142205.0968	636.24421
2010	10	595	142206.6774	636.42861
2010	10	596	142207.0323	636.47002
2010	10	597	142207.0323	636.47002
2010	10	598	142207.3871	636.51142
2010	10	599	142212.129	637.06506
2010	10	600	142212.129	637.06506
2010	10	601	142212.129	637.06506
2010	10	602	142213.7097	637.24971
2010	10	603	142215.2903	637.43443
2010	10	604	142215.2903	637.43443
2010	10	605	142215.2903	637.43443
2010	10	606	142215.2903	637.43443
2010	10	607	142215.2903	637.43443
2010	10	608	142215.2903	637.43443
2010	10	609	142216.871	637.6192
2010	10	610	142216.871	637.6192
2010	10	611	142216.871	637.6192
2010	10	612	142216.871	637.6192

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	613	142216.871	637.6192
2010	10	614	142218.4516	637.80403
2010	10	615	142218.4516	637.80403
2010	10	616	142218.4516	637.80403
2010	10	617	142218.4516	637.80403
2010	10	618	142218.8065	637.84553
2010	10	619	142218.8065	637.84553
2010	10	620	142218.8065	637.84553
2010	10	621	142219.1613	637.88703
2010	10	622	142219.1613	637.88703
2010	10	623	142219.1613	637.88703
2010	10	624	142219.1613	637.88703
2010	10	625	142219.1613	637.88703
2010	10	626	142219.1613	637.88703
2010	10	627	142223.9032	638.44193
2010	10	628	142223.9032	638.44193
2010	10	629	142223.9032	638.44193
2010	10	630	142225.4839	638.62701
2010	10	631	142227.0645	638.81215
2010	10	632	142228.6452	638.99734
2010	10	633	142230.2258	639.18259
2010	10	634	142231.8065	639.3679
2010	10	635	142233.3871	639.55326
2010	10	636	142234.9677	639.73869
2010	10	637	142239.7097	640.2953
2010	10	638	142239.7097	640.2953
2010	10	639	142239.7097	640.2953
2010	10	640	142295.4516	646.8769
2010	10	641	142295.4516	646.8769
2010	10	642	142295.4516	646.8769
2010	10	643	142295.4516	646.8769
2010	10	644	142297.0323	647.06458
2010	10	645	142298.6129	647.25231
2010	10	646	142298.6129	647.25231
2010	10	647	142298.6129	647.25231
2010	10	648	142298.6129	647.25231
2010	10	649	142298.6129	647.25231
2010	10	650	142298.6129	647.25231
2010	10	651	142298.6129	647.25231
2010	10	652	142298.6129	647.25231
2010	10	653	142298.6129	647.25231
2010	10	654	142298.6129	647.25231
2010	10	655	142298.6129	647.25231
2010	10	656	142298.6129	647.25231
2010	10	657	142298.6129	647.25231
2010	10	658	142298.6129	647.25231
2010	10	659	142298.6129	647.25231
2010	10	660	142298.6129	647.25231
2010	10	661	142298.6129	647.25231
2010	10	662	142298.6129	647.25231
2010	10	663	142298.6129	647.25231

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	664	142298.6129	647.25231
2010	10	665	142298.6129	647.25231
2010	10	666	142298.6129	647.25231
2010	10	667	142298.6129	647.25231
2010	10	668	142298.6129	647.25231
2010	10	669	142298.6129	647.25231
2010	10	670	142298.6129	647.25231
2010	10	671	142298.6129	647.25231
2010	10	672	142298.6129	647.25231
2010	10	673	142298.6129	647.25231
2010	10	674	142298.6129	647.25231
2010	10	675	142298.6129	647.25231
2010	10	676	142298.6129	647.25231
2010	10	677	142298.6129	647.25231
2010	10	678	142298.6129	647.25231
2010	10	679	142298.6129	647.25231
2010	10	680	142298.6129	647.25231
2010	10	681	142298.6129	647.25231
2010	10	682	142298.6129	647.25231
2010	10	683	142298.6129	647.25231
2010	10	684	142298.6129	647.25231
2010	10	685	142298.6129	647.25231
2010	10	686	142298.6129	647.25231
2010	10	687	142298.8065	647.2753
2010	10	688	142298.8065	647.2753
2010	10	689	142298.8065	647.2753
2010	10	690	142298.8065	647.2753
2010	10	691	142298.8065	647.2753
2010	10	692	142298.8065	647.2753
2010	10	693	142298.8065	647.2753
2010	10	694	142370.8065	655.88843
2010	10	695	142370.8065	655.88843
2010	10	696	142370.8065	655.88843
2010	10	697	142370.8065	655.88843
2010	10	698	142370.8065	655.88843
2010	10	699	142370.8065	655.88843
2010	10	700	142370.8065	655.88843
2010	10	701	142371	655.91174
2010	10	702	142371	655.91174
2010	10	703	142371.3871	655.95838
2010	10	704	142371.3871	655.95838
2010	10	705	142371.3871	655.95838
2010	10	706	142371.3871	655.95838
2010	10	707	142371.5806	655.9817
2010	10	708	142372.1613	656.05166
2010	10	709	142372.1613	656.05166
2010	10	710	142372.3548	656.07498
2010	10	711	142372.3548	656.07498
2010	10	712	142373.129	656.16828
2010	10	713	142373.129	656.16828
2010	10	714	142373.129	656.16828

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	715	142373.129	656.16828
2010	10	716	142373.129	656.16828
2010	10	717	142373.129	656.16828
2010	10	718	142373.129	656.16828
2010	10	719	142373.129	656.16828
2010	10	720	142373.129	656.16828
2010	10	721	142373.129	656.16828
2010	10	722	142373.3226	656.19161
2010	10	723	142373.3226	656.19161
2010	10	724	142373.3226	656.19161
2010	10	725	142373.3226	656.19161
2010	10	726	142373.3226	656.19161
2010	10	727	142373.5161	656.21494
2010	10	728	142373.5161	656.21494
2010	10	729	142373.5161	656.21494
2010	10	730	142373.5161	656.21494
2010	10	731	142407.6129	660.33826
2010	10	732	142407.6129	660.33826
2010	10	733	142407.6129	660.33826
2010	10	734	142407.6129	660.33826
2010	10	735	142407.6129	660.33826
2010	10	736	142407.6129	660.33826
2010	10	737	142407.6129	660.33826
2010	10	738	142407.6129	660.33826
2010	10	739	142407.6129	660.33826
2010	10	740	142407.6129	660.33826
2010	10	741	142407.6129	660.33826
2010	10	742	142407.6129	660.33826
2010	10	743	142407.6129	660.33826
2010	10	744	142407.6129	660.33826
2010	10	745	142407.6129	660.33826
2010	10	746	142407.6129	660.33826
2010	10	747	142443.0323	664.65057
2010	10	748	142443.0323	664.65057
2010	10	749	142443.0323	664.65057
2010	10	750	142443.0323	664.65057
2010	10	751	142443.0323	664.65057
2010	10	752	142443.0323	664.65057
2010	10	753	142443.0323	664.65057
2010	10	754	142443.0323	664.65057
2010	10	755	142443.0323	664.65057
2010	10	756	142443.0323	664.65057
2010	10	757	142443.0323	664.65057
2010	10	758	142443.0323	664.65057
2010	10	759	142443.0323	664.65057
2010	10	760	142443.0323	664.65057
2010	10	761	142443.0323	664.65057
2010	10	762	142443.0323	664.65057
2010	10	763	142443.0323	664.65057
2010	10	764	142443.0323	664.65057
2010	10	765	142443.0323	664.65057

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	766	142443.2258	664.67422
2010	10	767	142443.2258	664.67422
2010	10	768	142443.2258	664.67422
2010	10	769	142443.2258	664.67422
2010	10	770	142443.2258	664.67422
2010	10	771	142443.2258	664.67422
2010	10	772	142443.2258	664.67422
2010	10	773	142443.2258	664.67422
2010	10	774	142443.2258	664.67422
2010	10	775	142443.2258	664.67422
2010	10	776	142443.2258	664.67422
2010	10	777	142443.2258	664.67422
2010	10	778	142443.4194	664.69787
2010	10	779	142444	664.76881
2010	10	780	142444	664.76881
2010	10	781	142444.3871	664.81612
2010	10	782	142444.3871	664.81612
2010	10	783	142444.3871	664.81612
2010	10	784	142444.5806	664.83977
2010	10	785	142444.5806	664.83977
2010	10	786	142444.5806	664.83977
2010	10	787	142444.5806	664.83977
2010	10	788	142444.7742	664.86342
2010	10	789	142444.9677	664.88708
2010	10	790	142445.3548	664.93439
2010	10	791	142445.3548	664.93439
2010	10	792	142446.9032	665.12367
2010	10	793	142477.9032	668.92523
2010	10	794	142477.9032	668.92523
2010	10	795	142477.9032	668.92523
2010	10	796	142478.6774	669.02047
2010	10	797	142478.6774	669.02047
2010	10	798	142478.6774	669.02047
2010	10	799	142567.1935	680.00393
2010	10	800	142568.7419	680.19775
2010	10	801	142610.9355	685.50181
2010	10	802	142610.9355	685.50181
2010	10	803	142610.9355	685.50181
2010	10	804	142610.9355	685.50181
2010	10	805	142610.9355	685.50181
2010	10	806	142614.0323	685.89282
2010	10	807	142614.0323	685.89282
2010	10	808	142618.7419	686.48792
2010	10	809	142625.0645	687.28769
2010	10	810	142631.3871	688.08844
2010	10	811	142636.0323	688.67738
2010	10	812	142637.5806	688.87381
2010	10	813	142639.129	689.0703
2010	10	814	142640.7097	689.27094
2010	10	815	142645.4516	689.87324
2010	10	816	142645.4516	689.87324

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	817	142650.1613	690.47199
2010	10	818	142650.1613	690.47199
2010	10	819	142659.6452	691.67937
2010	10	820	142661.1935	691.8767
2010	10	821	142664.3548	692.27977
2010	10	822	142667.5161	692.68309
2010	10	823	142667.5161	692.68309
2010	10	824	142669.1613	692.89309
2010	10	825	142672.3226	693.29678
2010	10	826	142673.9677	693.50697
2010	10	827	142673.9677	693.50697
2010	10	828	142681.7742	694.50524
2010	10	829	142681.7742	694.50524
2010	10	830	142683.3226	694.70343
2010	10	831	142686.4194	695.09998
2010	10	832	142689.6129	695.50917
2010	10	833	142699.2903	696.75069
2010	10	834	142712.0645	698.39308
2010	10	835	142714.2581	698.67552
2010	10	836	142719	699.2865
2010	10	837	142723.7419	699.89804
2010	10	838	142728.5484	700.51847
2010	10	839	142736.4839	701.54408
2010	10	840	142744.4194	702.57128
2010	10	841	142755.6129	704.02291
2010	10	842	142763.5806	705.05813
2010	10	843	142768.3226	705.67499
2010	10	844	142773.8065	706.38908
2010	10	845	142776	706.67493
2010	10	846	142782.5806	707.53321
2010	10	847	142791.5806	708.70881
2010	10	848	142794.7419	709.12223
2010	10	849	142796.3871	709.33748
2010	10	850	142796.9355	709.40925
2010	10	851	142799.129	709.69639
2010	10	852	142799.129	709.69639
2010	10	853	142799.6774	709.76819
2010	10	854	142867.3226	718.68434
2010	10	855	142874.8065	719.678
2010	10	856	142882.3548	720.68169
2010	10	857	142890.4516	721.75993
2010	10	858	142893.0968	722.11255
2010	10	859	142893.0968	722.11255
2010	10	860	142893.0968	722.11255
2010	10	861	142893.0968	722.11255
2010	10	862	142897.8065	722.74084
2010	10	863	142902	723.30077
2010	10	864	142907.8387	724.08111
2010	10	865	142914.4516	724.96599
2010	10	866	142914.4516	724.96599
2010	10	867	142919.3871	725.62716

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	868	142929	726.91675
2010	10	869	142940.6452	728.4822
2010	10	870	142950.2903	729.78148
2010	10	871	142955.2581	730.45163
2010	10	872	142960.1935	731.11806
2010	10	873	142966.7742	732.00764
2010	10	874	142977.5484	733.46656
2010	10	875	142978.3871	733.58025
2010	10	876	142978.9355	733.6546
2010	10	877	142981.6774	734.02648
2010	10	878	142986.8065	734.72262
2010	10	879	142993.4194	735.6212
2010	10	880	142995.2258	735.86687
2010	10	881	142996.871	736.09067
2010	10	882	142997.2903	736.14773
2010	10	883	142997.7097	736.2048
2010	10	884	142997.7097	736.2048
2010	10	885	142997.7097	736.2048
2010	10	886	142998.8065	736.35407
2010	10	887	142999.2258	736.41115
2010	10	888	143003.9677	737.05693
2010	10	889	143005.6129	737.28112
2010	10	890	143005.6129	737.28112
2010	10	891	143013.7097	738.38552
2010	10	892	143018.7419	739.0728
2010	10	893	143018.7419	739.0728
2010	10	894	143021.2581	739.41669
2010	10	895	143027.9677	740.33455
2010	10	896	143037.3226	741.61626
2010	10	897	143045.4194	742.72749
2010	10	898	143047.9355	743.07317
2010	10	899	143057.7097	744.41761
2010	10	900	143062.7419	745.11079
2010	10	901	143064	745.28419
2010	10	902	143064.4194	745.342
2010	10	903	143066.4839	745.62667
2010	10	904	143069.4194	746.03163
2010	10	905	143076.6774	747.03391
2010	10	906	143077.5161	747.14982
2010	10	907	143113.5161	752.14288
2010	10	908	143131.0323	754.58497
2010	10	909	143131.5806	754.66157
2010	10	910	143131.5806	754.66157
2010	10	911	143131.5806	754.66157
2010	10	912	143131.5806	754.66157
2010	10	913	143132	754.72014
2010	10	914	143132.9677	754.85533
2010	10	915	143132.9677	754.85533
2010	10	916	143132.9677	754.85533
2010	10	917	143132.9677	754.85533
2010	10	918	143132.9677	754.85533

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	919	143132.9677	754.85533
2010	10	920	143132.9677	754.85533
2010	10	921	143132.9677	754.85533
2010	10	922	143132.9677	754.85533
2010	10	923	143132.9677	754.85533
2010	10	924	143133.5161	754.93195
2010	10	925	143133.5161	754.93195
2010	10	926	143133.5161	754.93195
2010	10	927	143133.5161	754.93195
2010	10	928	143135.1613	755.16186
2010	10	929	143135.1613	755.16186
2010	10	930	143135.1613	755.16186
2010	10	931	143135.1613	755.16186
2010	10	932	143135.7097	755.23851
2010	10	933	143136.8065	755.39184
2010	10	934	143138.4516	755.62189
2010	10	935	143138.4516	755.62189
2010	10	936	143142.8065	756.23121
2010	10	937	143144.4516	756.46153
2010	10	938	143144.4516	756.46153
2010	10	939	143144.4516	756.46153
2010	10	940	143144.4516	756.46153
2010	10	941	143144.4516	756.46153
2010	10	942	143144.4516	756.46153
2010	10	943	143145.5484	756.61512
2010	10	944	143145.5484	756.61512
2010	10	945	143145.5484	756.61512
2010	10	946	143145.5484	756.61512
2010	10	947	143145.5484	756.61512
2010	10	948	143145.5484	756.61512
2010	10	949	143145.5484	756.61512
2010	10	950	143145.5484	756.61512
2010	10	951	143145.5484	756.61512
2010	10	952	143145.5484	756.61512
2010	10	953	143145.5484	756.61512
2010	10	954	143145.5484	756.61512
2010	10	955	143145.5484	756.61512
2010	10	956	143145.5484	756.61512
2010	10	957	143145.5484	756.61512
2010	10	958	143145.5484	756.61512
2010	10	959	143145.5484	756.61512
2010	10	960	143145.5484	756.61512
2010	10	961	143293.7419	777.67183
2010	10	962	143293.7419	777.67183
2010	10	963	143293.7419	777.67183
2010	10	964	143293.7419	777.67183
2010	10	965	143293.7419	777.67183
2010	10	966	143293.7419	777.67183
2010	10	967	143293.7419	777.67183
2010	10	968	143353.7419	786.37125
2010	10	969	143353.7419	786.37125

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	10	970	143353.7419	786.37125
2010	10	971	143353.7419	786.37125
2010	10	972	143353.7419	786.37125
2010	10	973	143353.7419	786.37125
2010	10	974	143353.7419	786.37125
2010	10	975	143353.7419	786.37125
2010	10	976	143353.7419	786.37125
2010	10	977	143353.7419	786.37125
2010	10	978	143353.7419	786.37125
2010	10	979	143353.7419	786.37125
2010	10	980	143353.7419	786.37125
2010	10	981	143358.7419	787.10079
2010	10	982	143358.7419	787.10079
2010	10	983	143358.7419	787.10079
2010	10	984	143358.7419	787.10079
2010	10	985	143358.7419	787.10079
2010	10	986	143358.7419	787.10079
2010	10	987	143358.7419	787.10079
2010	10	988	143358.7419	787.10079
2010	10	989	143358.7419	787.10079
2010	10	990	143358.7419	787.10079
2010	10	991	143358.7419	787.10079
2010	10	992	143358.7419	787.10079
2010	10	993	143358.7419	787.10079
2010	10	994	143358.7419	787.10079
2010	10	995	143358.7419	787.10079
2010	10	996	143358.7419	787.10079
2010	10	997	143358.7419	787.10079
2010	10	998	143542.7419	814.44733
2010	10	999	144071.6129	898.72296

November 2010

Net Benefit Tab

Effective_month	Test_result
11/1/2010 0:00	\$36.83

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.96154396	1.115891503

Curve Parameters Tab

a	b	c	d
3.257449714	0.000155116	17.1492179	35.06092602

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	1	18340.86667	35.06093
2010	11	2	19713.63333	35.06093
2010	11	3	19739.8	35.06093
2010	11	4	20966.56667	35.06093
2010	11	5	24545.6	35.06093
2010	11	6	28492.3	35.06093
2010	11	7	30601.66667	35.06093
2010	11	8	30980.2	35.06093
2010	11	9	31847.8	35.06093
2010	11	10	31950.93333	35.06093
2010	11	11	32214.13333	35.06093
2010	11	12	32229.53333	35.06093
2010	11	13	32637.33333	35.06093
2010	11	14	32936.4	35.06093
2010	11	15	34248.36667	35.06093
2010	11	16	34460.3	35.06093
2010	11	17	34714.6	35.06093
2010	11	18	35058.1	35.06093
2010	11	19	35662.3	35.06093
2010	11	20	37363.3	35.06093
2010	11	21	39305.16667	35.06093
2010	11	22	40705.96667	35.06093
2010	11	23	42927.46667	35.06093
2010	11	24	46562.06667	35.06094
2010	11	25	51887.9	35.06095
2010	11	26	56862.2	35.06098
2010	11	27	62712.36667	35.06108
2010	11	28	69008.83333	35.06142
2010	11	29	74510.83333	35.06227
2010	11	30	79768.5	35.06444
2010	11	31	83558.6	35.06796
2010	11	32	85667.13333	35.07128
2010	11	33	87291.86667	35.07486
2010	11	34	88719.06667	35.07902
2010	11	35	89962.13333	35.08364
2010	11	36	90975.83333	35.08827
2010	11	37	91722.8	35.09227
2010	11	38	92630.23333	35.09794
2010	11	39	93552.7	35.10474
2010	11	40	94522.43333	35.11325
2010	11	41	95699.86667	35.12584
2010	11	42	96566.43333	35.137
2010	11	43	97562.13333	35.1522
2010	11	44	99433.83333	35.1895
2010	11	45	100602.4333	35.22017
2010	11	46	101526.5667	35.24952
2010	11	47	102626.4333	35.29157
2010	11	48	104456.5	35.38335
2010	11	49	105388.0333	35.4433
2010	11	50	106373.9667	35.51892
2010	11	51	107393.6	35.6129

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	52	108176.7667	35.69798
2010	11	53	108911.4	35.78967
2010	11	54	110625.8	36.05831
2010	11	55	111153.8333	36.15952
2010	11	56	112064.0333	36.35869
2010	11	57	112834.9667	36.55538
2010	11	58	113456.4	36.73542
2010	11	59	114284.2667	37.0094
2010	11	60	115345.0667	37.42698
2010	11	61	115908.4	37.68398
2010	11	62	116414.5333	37.93861
2010	11	63	117313.5667	38.45337
2010	11	64	117998.5667	38.90655
2010	11	65	119092.6	39.7592
2010	11	66	119549.8333	40.16935
2010	11	67	120273.6333	40.89304
2010	11	68	120726.7	41.39733
2010	11	69	121372.4667	42.19239
2010	11	70	121841.2	42.83129
2010	11	71	122074.5	43.1703
2010	11	72	122323.9667	43.5492
2010	11	73	122550.3	43.90825
2010	11	74	122807.9333	44.33547
2010	11	75	122963.6667	44.60366
2010	11	76	123098.4	44.84193
2010	11	77	123957.1667	46.50688
2010	11	78	124084.6667	46.77715
2010	11	79	124282.9667	47.21024
2010	11	80	124402.1	47.47809
2010	11	81	124603.1667	47.94361
2010	11	82	124698.4667	48.17032
2010	11	83	124814.6667	48.45214
2010	11	84	124937.2333	48.75597
2010	11	85	124985.4333	48.87734
2010	11	86	125090.2667	49.14502
2010	11	87	125198.8	49.42763
2010	11	88	125297.3	49.68901
2010	11	89	125391.2	49.94261
2010	11	90	125495.4667	50.22936
2010	11	91	125586.3333	50.48377
2010	11	92	125626.5667	50.59777
2010	11	93	125781.6333	51.04509
2010	11	94	125857.7	51.26921
2010	11	95	125910.3667	51.42622
2010	11	96	126005.4667	51.71359
2010	11	97	126070.7667	51.91384
2010	11	98	126264.8667	52.52337
2010	11	99	126333.6667	52.74468
2010	11	100	126378.7667	52.89127
2010	11	101	126527.7333	53.38415
2010	11	102	126613.0667	53.67261

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	103	126732.8333	54.08513
2010	11	104	126810.9333	54.35905
2010	11	105	126972.5	54.9383
2010	11	106	127158	55.62483
2010	11	107	127286.4333	56.114
2010	11	108	127446.1	56.73839
2010	11	109	127594.1	57.33368
2010	11	110	127698.7667	57.76451
2010	11	111	127773.8	58.07849
2010	11	112	127893.4333	58.58809
2010	11	113	128047.7	59.26192
2010	11	114	128143.9667	59.69215
2010	11	115	128397.7333	60.86329
2010	11	116	128515.1333	61.42378
2010	11	117	128709.7333	62.37977
2010	11	118	129033.6	64.04827
2010	11	119	129296.9667	65.47993
2010	11	120	129381.8667	65.95635
2010	11	121	129573.8667	67.06148
2010	11	122	129676.9333	67.67093
2010	11	123	129845.3667	68.69199
2010	11	124	129932.2	69.23081
2010	11	125	130013.9	69.74566
2010	11	126	130211.9	71.0258
2010	11	127	130282.7667	71.49537
2010	11	128	130389.3667	72.21329
2010	11	129	130505.5	73.01152
2010	11	130	130663.9333	74.12823
2010	11	131	130850.6	75.48618
2010	11	132	131012.7	76.70364
2010	11	133	131272.9	78.73502
2010	11	134	131600.4667	81.43381
2010	11	135	131887.4333	83.93481
2010	11	136	132079.5333	85.68395
2010	11	137	132338.7	88.14335
2010	11	138	132601.4333	90.7586
2010	11	139	132902.0667	93.90953
2010	11	140	133106.6	96.15454
2010	11	141	133399.3333	99.51746
2010	11	142	133606.5667	102.00947
2010	11	143	133815.0333	104.61354
2010	11	144	134033.4	107.44995
2010	11	145	134657.0333	116.20356
2010	11	146	134775.6	117.98387
2010	11	147	134866.9667	119.38236
2010	11	148	134946.1667	120.61369
2010	11	149	135018.7	121.75715
2010	11	150	135064.8667	122.49289
2010	11	151	135102.6	123.09887
2010	11	152	135122.3667	123.41799
2010	11	153	135139.8667	123.70148

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	154	135158.4333	124.00324
2010	11	155	135181.9667	124.3872
2010	11	156	135213.7	124.90758
2010	11	157	135247.2333	125.46077
2010	11	158	135272.8333	125.88538
2010	11	159	135360.3	127.35122
2010	11	160	135384.6	127.76264
2010	11	161	135412.2667	128.2333
2010	11	162	135438.8	128.68693
2010	11	163	135469.2667	129.21052
2010	11	164	135931.7	137.52699
2010	11	165	135971.8667	138.28314
2010	11	166	136014.1	139.08421
2010	11	167	136044.0667	139.65637
2010	11	168	136080.4333	140.35496
2010	11	169	136124.6667	141.21097
2010	11	170	136181.6333	142.32364
2010	11	171	136223.6333	143.15145
2010	11	172	136270.2333	144.0774
2010	11	173	136282.3	144.31846
2010	11	174	136371.7333	146.12177
2010	11	175	136566.1667	150.14565
2010	11	176	136630.1667	151.50179
2010	11	177	136647.7667	151.87752
2010	11	178	136671.4333	152.38468
2010	11	179	136687.6333	152.7331
2010	11	180	136759	154.28039
2010	11	181	136788.9667	154.93614
2010	11	182	136916.9	157.77647
2010	11	183	137002.8667	159.72278
2010	11	184	137086.7667	161.65207
2010	11	185	137136.3	162.80507
2010	11	186	137200.9	164.32459
2010	11	187	137323.6667	167.26229
2010	11	188	137395.2667	169.00634
2010	11	189	137466.7	170.76926
2010	11	190	137529.8	172.34581
2010	11	191	137602.7	174.19002
2010	11	192	137677.3333	176.10376
2010	11	193	137753.7	178.08919
2010	11	194	137771.9667	178.56823
2010	11	195	137806.5667	179.48
2010	11	196	137859.9333	180.89769
2010	11	197	137897.8333	181.91294
2010	11	198	137928.7667	182.74681
2010	11	199	137977.8333	184.07922
2010	11	200	137990.1667	184.41602
2010	11	201	137998.1333	184.63398
2010	11	202	138114.3667	187.8504
2010	11	203	138133.0333	188.37336
2010	11	204	138157.6333	189.06527

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	205	138168.0333	189.35873
2010	11	206	138180.4667	189.71029
2010	11	207	138211.3333	190.58654
2010	11	208	138222.4667	190.90381
2010	11	209	138245.8333	191.5718
2010	11	210	138251.1333	191.72372
2010	11	211	138253.5333	191.79256
2010	11	212	138255.8333	191.85855
2010	11	213	138886.4	211.04244
2010	11	214	138896.1333	211.35626
2010	11	215	138903.2667	211.5866
2010	11	216	138907.8333	211.73422
2010	11	217	138909.7667	211.79676
2010	11	218	139268.7333	223.79966
2010	11	219	139268.8	223.80196
2010	11	220	139268.8333	223.80312
2010	11	221	139269.2	223.81578
2010	11	222	139269.2	223.81578
2010	11	223	139274.4667	223.99784
2010	11	224	139274.5	223.99899
2010	11	225	139274.7333	224.00706
2010	11	226	139275.6667	224.03935
2010	11	227	139319.9	225.57567
2010	11	228	139346.9	226.51957
2010	11	229	139362.8667	227.07995
2010	11	230	139390.8667	228.06664
2010	11	231	139407.0667	228.63982
2010	11	232	139407.1	228.641
2010	11	233	139412.6333	228.83716
2010	11	234	139434.4	229.61077
2010	11	235	139467.2	230.78235
2010	11	236	139472.7	230.97949
2010	11	237	139485	231.42109
2010	11	238	139496.4333	231.83247
2010	11	239	139497.4667	231.86969
2010	11	240	139503.2333	232.07755
2010	11	241	139504.0667	232.1076
2010	11	242	139559.7667	234.1269
2010	11	243	139559.7667	234.1269
2010	11	244	139565.6333	234.34079
2010	11	245	139582.5	234.95699
2010	11	246	139599.1667	235.56776
2010	11	247	139655.8333	237.65837
2010	11	248	139677.4667	238.46223
2010	11	249	139702.4667	239.39516
2010	11	250	139729.5667	240.41129
2010	11	251	139768.9	241.89511
2010	11	252	139845.8667	244.82971
2010	11	253	139909.8333	247.3003
2010	11	254	139940.2333	248.48462
2010	11	255	139964.1	249.41905

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	256	140045.6	252.64088
2010	11	257	140080.4667	254.03396
2010	11	258	140152.9333	256.95794
2010	11	259	140198.1667	258.80283
2010	11	260	140210.1	259.29209
2010	11	261	140260.5333	261.3717
2010	11	262	140305.9333	263.26025
2010	11	263	140341.0667	264.73253
2010	11	264	140365.2333	265.75076
2010	11	265	140375.8667	266.20021
2010	11	266	140436.3	268.77129
2010	11	267	140439.4667	268.9068
2010	11	268	140450.2667	269.36955
2010	11	269	140498.8667	271.46327
2010	11	270	140506.2333	271.78226
2010	11	271	140511.2333	271.99902
2010	11	272	140513.5667	272.10024
2010	11	273	140515.6333	272.18992
2010	11	274	140549.6	273.66886
2010	11	275	140575.1667	274.78814
2010	11	276	140577.0333	274.87006
2010	11	277	140588.2667	275.36367
2010	11	278	140589.3333	275.41059
2010	11	279	140590.2	275.44873
2010	11	280	140665.5333	278.78651
2010	11	281	140676.9667	279.29712
2010	11	282	140676.9667	279.29712
2010	11	283	140677.7333	279.3314
2010	11	284	140680.0333	279.43426
2010	11	285	140681.0667	279.48049
2010	11	286	140726.3667	281.51564
2010	11	287	140740.3667	282.14803
2010	11	288	140742.9667	282.26565
2010	11	289	140784.1	284.13396
2010	11	290	140801.8333	284.94377
2010	11	291	140999.3333	294.14273
2010	11	292	141037.3	295.94953
2010	11	293	141052.7667	296.68918
2010	11	294	141076.1667	297.81221
2010	11	295	141096.4667	298.79037
2010	11	296	141127.5667	300.296
2010	11	297	141159.8333	301.86719
2010	11	298	141177.1333	302.71343
2010	11	299	141197.3333	303.70491
2010	11	300	141234.8333	305.55529
2010	11	301	141249.8	306.29735
2010	11	302	141288.2	308.21059
2010	11	303	141324.4333	310.02824
2010	11	304	141373.6	312.51406
2010	11	305	141404.4	314.08271
2010	11	306	141428.1667	315.29921

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	307	141442.5333	316.03714
2010	11	308	141453.9333	316.62407
2010	11	309	141468.0667	317.35344
2010	11	310	141491.2333	318.55306
2010	11	311	141521.5333	320.12976
2010	11	312	141540.6333	321.12816
2010	11	313	141562.8667	322.29475
2010	11	314	141574.3667	322.90002
2010	11	315	141599.2667	324.21495
2010	11	316	141627.2	325.69721
2010	11	317	141686.6	328.87452
2010	11	318	141744.8	332.02134
2010	11	319	141804.8	335.30077
2010	11	320	141869.4667	338.87583
2010	11	321	141926.8	342.08105
2010	11	322	141980.7667	345.12895
2010	11	323	142034.6333	348.20137
2010	11	324	142054.5667	349.34602
2010	11	325	142072.8333	350.39864
2010	11	326	142105.9333	352.31502
2010	11	327	142191.6	357.32909
2010	11	328	142234.8	359.88756
2010	11	329	142268.5667	361.90149
2010	11	330	142310.1667	364.39979
2010	11	331	142340.6333	366.24158
2010	11	332	142376.1667	368.40268
2010	11	333	142400.1333	369.86827
2010	11	334	142444.1667	372.57777
2010	11	335	142480.6667	374.84034
2010	11	336	142511.7667	376.78013
2010	11	337	142541.0333	378.61569
2010	11	338	142575.5333	380.79213
2010	11	339	142602.0333	382.47326
2010	11	340	142618	383.4901
2010	11	341	142710.7	389.45284
2010	11	342	142739.6667	391.3369
2010	11	343	142748	391.88077
2010	11	344	142769.1333	393.26376
2010	11	345	142822.8667	396.80432
2010	11	346	142825.3	396.96548
2010	11	347	142850.3	398.62541
2010	11	348	142889.9667	401.2748
2010	11	349	142904.7333	402.26601
2010	11	350	142910.6333	402.66279
2010	11	351	142920.6333	403.33629
2010	11	352	143048.9	412.08524
2010	11	353	143083.0333	414.44826
2010	11	354	143128.0333	417.58621
2010	11	355	143153.7	419.38762
2010	11	356	143188.7667	421.86248
2010	11	357	143220.7333	424.13244

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	358	143238.8333	425.42363
2010	11	359	143249.7333	426.20326
2010	11	360	143262.6	427.12556
2010	11	361	143276.7	428.13877
2010	11	362	143289.1	429.03198
2010	11	363	143318.9333	431.1893
2010	11	364	143361.5667	434.29273
2010	11	365	143513.9	445.58159
2010	11	366	143539	447.47206
2010	11	367	143571.6333	449.94293
2010	11	368	143584.9333	450.9542
2010	11	369	143602.0333	452.25803
2010	11	370	143623.4	453.89292
2010	11	371	143647.8667	455.77288
2010	11	372	143672.1667	457.64838
2010	11	373	143694.0333	459.34323
2010	11	374	143709.9667	460.58247
2010	11	375	143732.3667	462.33079
2010	11	376	143750.4333	463.74613
2010	11	377	143770.2667	465.30527
2010	11	378	143788.6333	466.75416
2010	11	379	143842.2	471.00781
2010	11	380	143856.3333	472.13709
2010	11	381	143867.3667	473.02071
2010	11	382	143883.8667	474.34546
2010	11	383	143898.3667	475.51295
2010	11	384	143963.2	480.77116
2010	11	385	144001.6	483.91508
2010	11	386	144006.3667	484.30689
2010	11	387	144017.5667	485.22884
2010	11	388	144022.9333	485.67128
2010	11	389	144026.9667	486.00408
2010	11	390	144035.1667	486.68145
2010	11	391	144055.7	488.38208
2010	11	392	144066.4333	489.2736
2010	11	393	144074.2333	489.92257
2010	11	394	144085.7333	490.88108
2010	11	395	144122.6667	493.9731
2010	11	396	144137.9	495.25452
2010	11	397	144162.5	497.33141
2010	11	398	144212.4	501.57314
2010	11	399	144215.9333	501.87496
2010	11	400	144220.5	502.26534
2010	11	401	144254.7333	505.20217
2010	11	402	144269.2333	506.45166
2010	11	403	144298.4667	508.98086
2010	11	404	144483.1	525.27142
2010	11	405	144487.9333	525.70531
2010	11	406	144492.9333	526.15457
2010	11	407	144510.8667	527.7693
2010	11	408	144511.7667	527.85047

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	409	144512.7	527.93467
2010	11	410	144513.6333	528.01888
2010	11	411	144514.1667	528.06701
2010	11	412	144515.5333	528.19036
2010	11	413	144516	528.23248
2010	11	414	144516	528.23248
2010	11	415	144516.5	528.27762
2010	11	416	144516.5	528.27762
2010	11	417	144517.1667	528.33781
2010	11	418	144631.3667	538.75775
2010	11	419	144632	538.81615
2010	11	420	144632	538.81615
2010	11	421	144632.9667	538.9053
2010	11	422	144632.9667	538.9053
2010	11	423	144632.9667	538.9053
2010	11	424	144633	538.90837
2010	11	425	144633.5333	538.95756
2010	11	426	144633.5333	538.95756
2010	11	427	144633.5667	538.96063
2010	11	428	144633.5667	538.96063
2010	11	429	144651.5667	540.62364
2010	11	430	144651.5667	540.62364
2010	11	431	144651.5667	540.62364
2010	11	432	144651.5667	540.62364
2010	11	433	144651.5667	540.62364
2010	11	434	144651.5667	540.62364
2010	11	435	144651.5667	540.62364
2010	11	436	144652.0333	540.66683
2010	11	437	144652.0333	540.66683
2010	11	438	144652.0333	540.66683
2010	11	439	144652.0333	540.66683
2010	11	440	144691.0333	544.28917
2010	11	441	144691.0333	544.28917
2010	11	442	144691.1	544.29538
2010	11	443	144709.1333	545.97911
2010	11	444	144709.2	545.98534
2010	11	445	144709.2	545.98534
2010	11	446	144709.2	545.98534
2010	11	447	144710.5333	546.11006
2010	11	448	144710.5333	546.11006
2010	11	449	144710.5333	546.11006
2010	11	450	144710.5333	546.11006
2010	11	451	144710.5333	546.11006
2010	11	452	144710.5333	546.11006
2010	11	453	144710.5333	546.11006
2010	11	454	144710.5333	546.11006
2010	11	455	144710.5333	546.11006
2010	11	456	144731.1667	548.04387
2010	11	457	144731.1667	548.04387
2010	11	458	144758.2333	550.59172
2010	11	459	144773.5333	552.03755

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	460	144773.5333	552.03755
2010	11	461	144794.0333	553.98112
2010	11	462	144812.6333	555.75088
2010	11	463	144812.6667	555.75406
2010	11	464	144812.7	555.75724
2010	11	465	144812.7	555.75724
2010	11	466	144817.8667	556.24991
2010	11	467	144843.4	558.69154
2010	11	468	144848.5	559.1806
2010	11	469	144879.2667	562.14062
2010	11	470	144879.2667	562.14062
2010	11	471	144879.2667	562.14062
2010	11	472	144879.2667	562.14062
2010	11	473	144904.2667	564.55815
2010	11	474	144925	566.5715
2010	11	475	144940.4	568.07189
2010	11	476	144949	568.91162
2010	11	477	144954.8667	569.48522
2010	11	478	144954.9	569.48848
2010	11	479	144959.8	569.96803
2010	11	480	144963.8	570.35983
2010	11	481	144969.6333	570.93171
2010	11	482	144973.1667	571.27841
2010	11	483	144979.7	571.92005
2010	11	484	144983.4333	572.28705
2010	11	485	144984.1333	572.35589
2010	11	486	144985.0667	572.4477
2010	11	487	144985.0667	572.4477
2010	11	488	144985.0667	572.4477
2010	11	489	144987.6333	572.70023
2010	11	490	144990.2	572.95288
2010	11	491	144993	573.22864
2010	11	492	144993.7	573.2976
2010	11	493	144994.5	573.37642
2010	11	494	145003.8	574.29359
2010	11	495	145015	575.40022
2010	11	496	145040.2667	577.90506
2010	11	497	145062.5	580.11879
2010	11	498	145081.9667	582.06447
2010	11	499	145106.1667	584.49292
2010	11	500	145129.2667	586.82104
2010	11	501	145152.1333	589.13536
2010	11	502	145175.7333	591.53408
2010	11	503	145192.7	593.265
2010	11	504	145206.3667	594.66317
2010	11	505	145214.1333	595.4593
2010	11	506	145219.4667	596.00665
2010	11	507	145222.9333	596.36272
2010	11	508	145223.4333	596.41409
2010	11	509	145223.4333	596.41409
2010	11	510	145223.4333	596.41409

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	511	145224.6333	596.53741
2010	11	512	145225.3333	596.60936
2010	11	513	145225.3333	596.60936
2010	11	514	145226.0333	596.68132
2010	11	515	145226.0333	596.68132
2010	11	516	145230.2333	597.11325
2010	11	517	145259.3667	600.11855
2010	11	518	145259.3667	600.11855
2010	11	519	145263.2	600.51517
2010	11	520	145263.9	600.58763
2010	11	521	145267.7333	600.98459
2010	11	522	145283.0667	602.5752
2010	11	523	145286.8667	602.97009
2010	11	524	145300.9333	604.43426
2010	11	525	145310.5333	605.43567
2010	11	526	145314.3667	605.83603
2010	11	527	145314.3667	605.83603
2010	11	528	145314.3667	605.83603
2010	11	529	145314.3667	605.83603
2010	11	530	145323.0667	606.74571
2010	11	531	145348.2333	609.38535
2010	11	532	145380.1667	612.75227
2010	11	533	145392.9	614.10032
2010	11	534	145408.6	615.76677
2010	11	535	145421.9333	617.18578
2010	11	536	145462.4	621.51375
2010	11	537	145485.5333	624.00234
2010	11	538	145504.0667	626.00369
2010	11	539	145506.7333	626.29222
2010	11	540	145525.4	628.31583
2010	11	541	145532.6	629.09822
2010	11	542	145540.6	629.96874
2010	11	543	145557.3333	631.79373
2010	11	544	145592.1	635.60339
2010	11	545	145618.0667	638.46463
2010	11	546	145618.0667	638.46463
2010	11	547	145628.3	639.59597
2010	11	548	145630.7	639.86161
2010	11	549	145649.2	641.91315
2010	11	550	145659.2	643.02499
2010	11	551	145670.7	644.30612
2010	11	552	145673.9	644.66309
2010	11	553	145680.9333	645.44841
2010	11	554	145685.7333	645.98495
2010	11	555	145685.7333	645.98495
2010	11	556	145685.7333	645.98495
2010	11	557	145685.7333	645.98495
2010	11	558	145691.1667	646.59285
2010	11	559	145695	647.0221
2010	11	560	145695	647.0221
2010	11	561	145703.8333	648.01238

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	562	145713.8333	649.1354
2010	11	563	145733.1667	651.31239
2010	11	564	145751.8333	653.42164
2010	11	565	145769.5	655.42455
2010	11	566	145794.5	658.26994
2010	11	567	145797.8333	658.65031
2010	11	568	145815	660.61289
2010	11	569	145815	660.61289
2010	11	570	145815	660.61289
2010	11	571	145818.3333	660.99469
2010	11	572	145826	661.87372
2010	11	573	145829.8333	662.31369
2010	11	574	145836.5	663.0796
2010	11	575	145845.2333	664.08436
2010	11	576	145851.9	664.85243
2010	11	577	145856.2667	665.35602
2010	11	578	145859.3667	665.71378
2010	11	579	145860.4	665.83308
2010	11	580	145866.3667	666.52237
2010	11	581	145866.3667	666.52237
2010	11	582	145870.5	667.00031
2010	11	583	145870.5	667.00031
2010	11	584	145871.5333	667.11985
2010	11	585	145871.5333	667.11985
2010	11	586	145871.5333	667.11985
2010	11	587	145871.5333	667.11985
2010	11	588	145873.6	667.359
2010	11	589	145874.6333	667.47861
2010	11	590	145875.6667	667.59824
2010	11	591	145875.6667	667.59824
2010	11	592	145875.6667	667.59824
2010	11	593	145875.6667	667.59824
2010	11	594	145876.7	667.7179
2010	11	595	145876.7	667.7179
2010	11	596	145876.7	667.7179
2010	11	597	145876.7	667.7179
2010	11	598	145876.7	667.7179
2010	11	599	145876.7	667.7179
2010	11	600	145876.7	667.7179
2010	11	601	145876.7	667.7179
2010	11	602	145876.7	667.7179
2010	11	603	145876.7	667.7179
2010	11	604	145876.7	667.7179
2010	11	605	145876.7	667.7179
2010	11	606	145876.7	667.7179
2010	11	607	145876.7	667.7179
2010	11	608	145876.7	667.7179
2010	11	609	145876.7	667.7179
2010	11	610	145876.7	667.7179
2010	11	611	145876.7	667.7179
2010	11	612	145876.7	667.7179

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	613	145876.7	667.7179
2010	11	614	145877.0667	667.76036
2010	11	615	145878.1667	667.88777
2010	11	616	145878.5333	667.93025
2010	11	617	145878.9	667.97272
2010	11	618	145879.2667	668.0152
2010	11	619	145879.2667	668.0152
2010	11	620	145879.2667	668.0152
2010	11	621	145879.6333	668.05769
2010	11	622	145879.6333	668.05769
2010	11	623	145880.3667	668.14266
2010	11	624	145880.3667	668.14266
2010	11	625	145880.3667	668.14266
2010	11	626	145886	668.79581
2010	11	627	145889.2667	669.17486
2010	11	628	145889.2667	669.17486
2010	11	629	145891.2667	669.40705
2010	11	630	145891.2667	669.40705
2010	11	631	145901.4333	670.58865
2010	11	632	145901.4333	670.58865
2010	11	633	145906.3333	671.15893
2010	11	634	145907.9667	671.34914
2010	11	635	145907.9667	671.34914
2010	11	636	145907.9667	671.34914
2010	11	637	145907.9667	671.34914
2010	11	638	145907.9667	671.34914
2010	11	639	145907.9667	671.34914
2010	11	640	145914.5	672.11053
2010	11	641	145916.1333	672.30102
2010	11	642	145916.1333	672.30102
2010	11	643	145921.0333	672.87284
2010	11	644	145921.0333	672.87284
2010	11	645	145921.0333	672.87284
2010	11	646	145922.6667	673.06355
2010	11	647	145922.6667	673.06355
2010	11	648	145922.6667	673.06355
2010	11	649	145924.3	673.25433
2010	11	650	145929.2	673.827
2010	11	651	145930.8333	674.018
2010	11	652	145930.8333	674.018
2010	11	653	145930.8333	674.018
2010	11	654	145930.8333	674.018
2010	11	655	145930.8333	674.018
2010	11	656	145930.8333	674.018
2010	11	657	145930.8333	674.018
2010	11	658	145930.8333	674.018
2010	11	659	146002.8333	682.49478
2010	11	660	146002.8333	682.49478
2010	11	661	146002.8333	682.49478
2010	11	662	146002.8333	682.49478
2010	11	663	146002.8333	682.49478

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	664	146002.8333	682.49478
2010	11	665	146002.8333	682.49478
2010	11	666	146002.8333	682.49478
2010	11	667	146002.8333	682.49478
2010	11	668	146002.8333	682.49478
2010	11	669	146002.8333	682.49478
2010	11	670	146002.8333	682.49478
2010	11	671	146002.8333	682.49478
2010	11	672	146002.8333	682.49478
2010	11	673	146002.8333	682.49478
2010	11	674	146002.8333	682.49478
2010	11	675	146002.8333	682.49478
2010	11	676	146002.8333	682.49478
2010	11	677	146002.8333	682.49478
2010	11	678	146002.8333	682.49478
2010	11	679	146002.8333	682.49478
2010	11	680	146002.8333	682.49478
2010	11	681	146002.8333	682.49478
2010	11	682	146002.8333	682.49478
2010	11	683	146002.8333	682.49478
2010	11	684	146002.8333	682.49478
2010	11	685	146002.8333	682.49478
2010	11	686	146002.8333	682.49478
2010	11	687	146002.8333	682.49478
2010	11	688	146002.8333	682.49478
2010	11	689	146002.8333	682.49478
2010	11	690	146002.8333	682.49478
2010	11	691	146002.8333	682.49478
2010	11	692	146002.8333	682.49478
2010	11	693	146002.8333	682.49478
2010	11	694	146002.8333	682.49478
2010	11	695	146002.8333	682.49478
2010	11	696	146002.8333	682.49478
2010	11	697	146002.8333	682.49478
2010	11	698	146002.8333	682.49478
2010	11	699	146002.8333	682.49478
2010	11	700	146002.8333	682.49478
2010	11	701	146002.8333	682.49478
2010	11	702	146002.8333	682.49478
2010	11	703	146002.8333	682.49478
2010	11	704	146002.8333	682.49478
2010	11	705	146002.8333	682.49478
2010	11	706	146002.8333	682.49478
2010	11	707	146002.8333	682.49478
2010	11	708	146002.8333	682.49478
2010	11	709	146002.8333	682.49478
2010	11	710	146002.8333	682.49478
2010	11	711	146002.8333	682.49478
2010	11	712	146002.8333	682.49478
2010	11	713	146002.8333	682.49478
2010	11	714	146074.8333	691.084

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	715	146074.8333	691.084
2010	11	716	146074.8333	691.084
2010	11	717	146074.8333	691.084
2010	11	718	146074.8333	691.084
2010	11	719	146074.8333	691.084
2010	11	720	146074.8333	691.084
2010	11	721	146074.8333	691.084
2010	11	722	146074.8333	691.084
2010	11	723	146074.8333	691.084
2010	11	724	146074.8333	691.084
2010	11	725	146074.8333	691.084
2010	11	726	146074.8333	691.084
2010	11	727	146074.8333	691.084
2010	11	728	146074.8333	691.084
2010	11	729	146074.8333	691.084
2010	11	730	146074.8333	691.084
2010	11	731	146074.8333	691.084
2010	11	732	146074.8333	691.084
2010	11	733	146074.8333	691.084
2010	11	734	146074.8333	691.084
2010	11	735	146074.8333	691.084
2010	11	736	146074.8333	691.084
2010	11	737	146074.8333	691.084
2010	11	738	146074.8333	691.084
2010	11	739	146074.8333	691.084
2010	11	740	146074.8333	691.084
2010	11	741	146074.8333	691.084
2010	11	742	146074.8333	691.084
2010	11	743	146074.8333	691.084
2010	11	744	146074.8333	691.084
2010	11	745	146074.8333	691.084
2010	11	746	146074.8333	691.084
2010	11	747	146074.8333	691.084
2010	11	748	146074.8333	691.084
2010	11	749	146074.8333	691.084
2010	11	750	146074.8333	691.084
2010	11	751	146074.8333	691.084
2010	11	752	146074.8333	691.084
2010	11	753	146074.8333	691.084
2010	11	754	146074.8333	691.084
2010	11	755	146074.8333	691.084
2010	11	756	146074.8333	691.084
2010	11	757	146074.8333	691.084
2010	11	758	146074.8333	691.084
2010	11	759	146074.8333	691.084
2010	11	760	146074.8333	691.084
2010	11	761	146074.8333	691.084
2010	11	762	146074.8333	691.084
2010	11	763	146074.8333	691.084
2010	11	764	146074.8333	691.084
2010	11	765	146074.8333	691.084

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	766	146074.8333	691.084
2010	11	767	146074.8333	691.084
2010	11	768	146074.8333	691.084
2010	11	769	146110.8333	695.42125
2010	11	770	146110.8333	695.42125
2010	11	771	146110.8333	695.42125
2010	11	772	146110.8333	695.42125
2010	11	773	146110.8333	695.42125
2010	11	774	146168.6333	702.44501
2010	11	775	146168.6333	702.44501
2010	11	776	146168.6333	702.44501
2010	11	777	146168.6333	702.44501
2010	11	778	146168.6333	702.44501
2010	11	779	146168.6333	702.44501
2010	11	780	146168.6333	702.44501
2010	11	781	146168.6333	702.44501
2010	11	782	146168.6333	702.44501
2010	11	783	146168.6333	702.44501
2010	11	784	146168.6333	702.44501
2010	11	785	146168.6333	702.44501
2010	11	786	146168.6333	702.44501
2010	11	787	146168.6333	702.44501
2010	11	788	146168.6333	702.44501
2010	11	789	146168.6333	702.44501
2010	11	790	146169.4333	702.54275
2010	11	791	146169.4333	702.54275
2010	11	792	146169.6333	702.56719
2010	11	793	146200.7	706.37387
2010	11	794	146201.5	706.47218
2010	11	795	146201.9	706.52134
2010	11	796	146201.9	706.52134
2010	11	797	146201.9	706.52134
2010	11	798	146202.1	706.54592
2010	11	799	146202.1	706.54592
2010	11	800	146202.1	706.54592
2010	11	801	146202.1	706.54592
2010	11	802	146202.1	706.54592
2010	11	803	146202.1	706.54592
2010	11	804	146202.3	706.57051
2010	11	805	146203.5	706.71802
2010	11	806	146203.5	706.71802
2010	11	807	146203.9	706.7672
2010	11	808	146204.1	706.7918
2010	11	809	146204.1	706.7918
2010	11	810	146204.1	706.7918
2010	11	811	146205.1	706.91476
2010	11	812	146205.7	706.98856
2010	11	813	146205.7	706.98856
2010	11	814	146205.7	706.98856
2010	11	815	146205.7	706.98856
2010	11	816	146205.7	706.98856

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	817	146205.7	706.98856
2010	11	818	146205.7	706.98856
2010	11	819	146205.7	706.98856
2010	11	820	146205.7	706.98856
2010	11	821	146205.7	706.98856
2010	11	822	146205.7	706.98856
2010	11	823	146205.7	706.98856
2010	11	824	146241.7	711.43096
2010	11	825	146241.7	711.43096
2010	11	826	146241.7	711.43096
2010	11	827	146241.7	711.43096
2010	11	828	146241.7	711.43096
2010	11	829	146241.7	711.43096
2010	11	830	146241.7	711.43096
2010	11	831	146241.7	711.43096
2010	11	832	146241.7	711.43096
2010	11	833	146241.7	711.43096
2010	11	834	146241.7	711.43096
2010	11	835	146241.7	711.43096
2010	11	836	146241.7	711.43096
2010	11	837	146241.7	711.43096
2010	11	838	146241.7	711.43096
2010	11	839	146241.7	711.43096
2010	11	840	146241.7	711.43096
2010	11	841	146249.7	712.42214
2010	11	842	146251.3	712.62055
2010	11	843	146252.9	712.81902
2010	11	844	146260.9	713.81224
2010	11	845	146267.3	714.60786
2010	11	846	146267.3	714.60786
2010	11	847	146267.3	714.60786
2010	11	848	146267.3	714.60786
2010	11	849	146290.0333	717.44152
2010	11	850	146294.9	718.04967
2010	11	851	146302.9667	719.0589
2010	11	852	146319.3	721.10695
2010	11	853	146333.9667	722.95124
2010	11	854	146333.9667	722.95124
2010	11	855	146338.7667	723.5559
2010	11	856	146341.9667	723.9593
2010	11	857	146355.0333	725.60899
2010	11	858	146358.3	726.02203
2010	11	859	146368.1	727.26262
2010	11	860	146368.1	727.26262
2010	11	861	146371.3667	727.67665
2010	11	862	146371.3667	727.67665
2010	11	863	146384.4333	729.33524
2010	11	864	146387.7	729.7505
2010	11	865	146387.7	729.7505
2010	11	866	146387.7	729.7505
2010	11	867	146387.7	729.7505

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	868	146387.7	729.7505
2010	11	869	146387.7	729.7505
2010	11	870	146387.7	729.7505
2010	11	871	146387.7	729.7505
2010	11	872	146387.7	729.7505
2010	11	873	146387.7	729.7505
2010	11	874	146387.7	729.7505
2010	11	875	146387.7	729.7505
2010	11	876	146387.7	729.7505
2010	11	877	146387.7	729.7505
2010	11	878	146387.7	729.7505
2010	11	879	146444.7	737.03659
2010	11	880	146444.7	737.03659
2010	11	881	146444.7	737.03659
2010	11	882	146449.8	737.69222
2010	11	883	146460	739.00531
2010	11	884	146471.9	740.54035
2010	11	885	146483.8	742.07873
2010	11	886	146485.5	742.29878
2010	11	887	146490.0333	742.88589
2010	11	888	146495.7	743.62048
2010	11	889	146504.7667	744.79739
2010	11	890	146509.3	745.38658
2010	11	891	146517.2333	746.41885
2010	11	892	146521.2	746.93554
2010	11	893	146526.3	747.60041
2010	11	894	146531.4	748.2659
2010	11	895	146534.8	748.70991
2010	11	896	146545.5667	750.11776
2010	11	897	146553.5	751.15689
2010	11	898	146556.3333	751.52838
2010	11	899	146558.6	751.82571
2010	11	900	146559.1667	751.90006
2010	11	901	146559.7333	751.97442
2010	11	902	146561.4333	752.19754
2010	11	903	146562	752.27193
2010	11	904	146562	752.27193
2010	11	905	146562	752.27193
2010	11	906	146562	752.27193
2010	11	907	146569.8	753.29667
2010	11	908	146580.2	754.66526
2010	11	909	146586.2667	755.46481
2010	11	910	146601	757.41028
2010	11	911	146614	759.13123
2010	11	912	146614	759.13123
2010	11	913	146615.3	759.30355
2010	11	914	146633.9333	761.77799
2010	11	915	146636.5333	762.12394
2010	11	916	146643.4667	763.04725
2010	11	917	146646.5	763.45157
2010	11	918	146658.2	765.0132

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	919	146662.5333	765.59243
2010	11	920	146664.2667	765.82425
2010	11	921	146672.0667	766.86835
2010	11	922	146686.3667	768.78641
2010	11	923	146692	769.54339
2010	11	924	146695.4667	770.00961
2010	11	925	146700.6667	770.7095
2010	11	926	146702.4	770.94294
2010	11	927	146702.8333	771.00131
2010	11	928	146702.8333	771.00131
2010	11	929	146704.1333	771.17646
2010	11	930	146705	771.29325
2010	11	931	146705	771.29325
2010	11	932	146705	771.29325
2010	11	933	146705	771.29325
2010	11	934	146741	776.1608
2010	11	935	146741	776.1608
2010	11	936	146741	776.1608
2010	11	937	146801	784.345
2010	11	938	146801	784.345
2010	11	939	146801	784.345
2010	11	940	146801	784.345
2010	11	941	146801	784.345
2010	11	942	146801	784.345
2010	11	943	146801	784.345
2010	11	944	146801	784.345
2010	11	945	146802.7	784.5782
2010	11	946	146803.8333	784.7337
2010	11	947	146807.2333	785.20041
2010	11	948	146807.8	785.27822
2010	11	949	146807.8	785.27822
2010	11	950	146807.8	785.27822
2010	11	951	146808.3667	785.35605
2010	11	952	146810.0667	785.58956
2010	11	953	146810.0667	785.58956
2010	11	954	146810.6333	785.66741
2010	11	955	146811.2	785.74527
2010	11	956	146812.3333	785.90102
2010	11	957	146813.4667	786.0568
2010	11	958	146813.4667	786.0568
2010	11	959	146813.4667	786.0568
2010	11	960	146815.1667	786.29053
2010	11	961	146816.8667	786.52433
2010	11	962	146816.8667	786.52433
2010	11	963	146821.1667	787.11604
2010	11	964	146821.7333	787.19406
2010	11	965	146821.7333	787.19406
2010	11	966	146956.9	806.03529
2010	11	967	147484.9	884.26848
2010	11	968	147484.9	884.26848
2010	11	969	147484.9	884.26848

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	11	970	147484.9	884.26848
2010	11	971	147484.9	884.26848
2010	11	972	147484.9	884.26848
2010	11	973	147484.9	884.26848
2010	11	974	147484.9	884.26848
2010	11	975	147484.9	884.26848
2010	11	976	147484.9	884.26848
2010	11	977	147484.9	884.26848
2010	11	978	147484.9	884.26848
2010	11	979	147484.9	884.26848
2010	11	980	147484.9	884.26848
2010	11	981	147489.9	885.04606
2010	11	982	147489.9	885.04606
2010	11	983	147489.9	885.04606
2010	11	984	147489.9	885.04606
2010	11	985	147489.9	885.04606
2010	11	986	147489.9	885.04606
2010	11	987	147489.9	885.04606
2010	11	988	147489.9	885.04606
2010	11	989	147638.1667	908.43027
2010	11	990	147638.1667	908.43027
2010	11	991	147638.1667	908.43027
2010	11	992	147638.1667	908.43027
2010	11	993	147638.1667	908.43027
2010	11	994	147638.1667	908.43027
2010	11	995	147638.1667	908.43027
2010	11	996	147638.1667	908.43027
2010	11	997	147638.1667	908.43027
2010	11	998	147695.1667	917.5904
2010	11	999	147696.0667	917.73581

December 2010

Net Benefit Tab

Effective_month	Test_result
12/1/2010 0:00	\$37.04

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.719381689	1.180646556

Curve Parameters Tab

a	b	c	d
3.191085903	0.000142238	16.38377005	35.15798882

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	1	20576.77419	35.15799
2010	12	2	21386.70968	35.15799
2010	12	3	21613.12903	35.15799
2010	12	4	22850.35484	35.15799
2010	12	5	26467.03226	35.15799
2010	12	6	31167.35484	35.15799
2010	12	7	33510.90323	35.15799
2010	12	8	33691.74194	35.15799
2010	12	9	34567.09677	35.15799
2010	12	10	34619.51613	35.15799
2010	12	11	34672.09677	35.15799
2010	12	12	34698.45161	35.15799
2010	12	13	34750.29032	35.15799
2010	12	14	34967.35484	35.15799
2010	12	15	36688.29032	35.15799
2010	12	16	37446.74194	35.15799
2010	12	17	37495.96774	35.15799
2010	12	18	37602.6129	35.15799
2010	12	19	37800.58065	35.15799
2010	12	20	38370.35484	35.15799
2010	12	21	40646.09677	35.15799
2010	12	22	43083.96774	35.158
2010	12	23	46480.3871	35.158
2010	12	24	48244.74194	35.15801
2010	12	25	51429.41935	35.15802
2010	12	26	54684.25806	35.15804
2010	12	27	60754.32258	35.15811
2010	12	28	67891.90323	35.15839
2010	12	29	76148.74194	35.15955
2010	12	30	82047.70968	35.16211
2010	12	31	86236.29032	35.1662
2010	12	32	89603.67742	35.1723
2010	12	33	91805.22581	35.17855
2010	12	34	93189.32258	35.18382
2010	12	35	94673.45161	35.19098
2010	12	36	95916.70968	35.19848
2010	12	37	96944.35484	35.20595
2010	12	38	98330.41935	35.21825
2010	12	39	99337.58065	35.22913
2010	12	40	100165.3548	35.23953
2010	12	41	101190	35.25452
2010	12	42	102881.8387	35.28556
2010	12	43	103946.8387	35.31003
2010	12	44	105522.129	35.35508
2010	12	45	106847.0645	35.40317
2010	12	46	108098.2258	35.4593
2010	12	47	108951.9032	35.50481
2010	12	48	109804	35.55709
2010	12	49	110913.1613	35.63712
2010	12	50	111557.9355	35.69082
2010	12	51	112316	35.76171

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	52	112927	35.82566
2010	12	53	113721.7742	35.91908
2010	12	54	114539	36.02878
2010	12	55	115258.4839	36.13838
2010	12	56	115851.0645	36.23894
2010	12	57	116711.9032	36.40367
2010	12	58	117375.6774	36.54764
2010	12	59	118055.0968	36.71225
2010	12	60	118937.6774	36.95554
2010	12	61	119602.1935	37.16354
2010	12	62	120355.0645	37.42842
2010	12	63	120991.9355	37.67962
2010	12	64	121649.5806	37.96822
2010	12	65	122434.2581	38.3561
2010	12	66	122825.9677	38.56932
2010	12	67	123558.5161	39.00696
2010	12	68	124119.3226	39.37957
2010	12	69	124902.1613	39.96079
2010	12	70	125319.8387	40.30297
2010	12	71	126088	40.99718
2010	12	72	126602.6129	41.5139
2010	12	73	127116.0645	42.07502
2010	12	74	127473.8387	42.49505
2010	12	75	127731.5484	42.81331
2010	12	76	128131.0968	43.33425
2010	12	77	128527.3548	43.88591
2010	12	78	128791.7097	44.27448
2010	12	79	128990.129	44.57746
2010	12	80	129362.7097	45.17385
2010	12	81	129527	45.44869
2010	12	82	129732.2903	45.80273
2010	12	83	129942.6129	46.17809
2010	12	84	130076.6129	46.42412
2010	12	85	130298.4194	46.84348
2010	12	86	130470.7742	47.18009
2010	12	87	130614.7097	47.46862
2010	12	88	130717.4194	47.67874
2010	12	89	130867.7419	47.99273
2010	12	90	131023.2258	48.3258
2010	12	91	131274.5806	48.88261
2010	12	92	131408	49.18767
2010	12	93	131591.4516	49.61823
2010	12	94	131750.2258	50.00152
2010	12	95	131936.9355	50.46527
2010	12	96	132081.8387	50.83514
2010	12	97	132338	51.511
2010	12	98	132477.871	51.89226
2010	12	99	132647.3871	52.36626
2010	12	100	132990.2581	53.36644
2010	12	101	133163.4839	53.89364
2010	12	102	133452.7742	54.80834

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	103	133625.9032	55.37697
2010	12	104	133876.7097	56.23004
2010	12	105	134136.7419	57.15251
2010	12	106	134354.2581	57.9551
2010	12	107	134819.1935	59.77018
2010	12	108	135110.2258	60.97918
2010	12	109	135445.4516	62.44555
2010	12	110	135651.129	63.38617
2010	12	111	135856.9355	64.35983
2010	12	112	136214.2581	66.13076
2010	12	113	136514.6774	67.7025
2010	12	114	137246.4194	71.87275
2010	12	115	138045.2258	77.03761
2010	12	116	138252.3226	78.49135
2010	12	117	138497.4839	80.27767
2010	12	118	138711.1935	81.89478
2010	12	119	138833.871	82.84912
2010	12	120	138939.6452	83.68759
2010	12	121	139136.0968	85.28417
2010	12	122	139264.7742	86.35831
2010	12	123	139382.3226	87.35966
2010	12	124	139463.7097	88.06441
2010	12	125	139507.7742	88.44994
2010	12	126	139617.871	89.42552
2010	12	127	139670.8065	89.90093
2010	12	128	139720.2258	90.34851
2010	12	129	139772.1613	90.82283
2010	12	130	139812.0323	91.18973
2010	12	131	139889.7097	91.91149
2010	12	132	140008.5484	93.03374
2010	12	133	140087	93.78673
2010	12	134	140241.871	95.30209
2010	12	135	140361.6774	96.50117
2010	12	136	140449.2581	97.39282
2010	12	137	140580.9355	98.75786
2010	12	138	140739.7097	100.44368
2010	12	139	140924.7419	102.46477
2010	12	140	141054.0323	103.91401
2010	12	141	141212.1613	105.729
2010	12	142	141303.8387	106.80312
2010	12	143	141553.1935	109.80808
2010	12	144	141658.129	111.11003
2010	12	145	141844.6774	113.48088
2010	12	146	141957.871	114.95539
2010	12	147	142153.0323	117.56314
2010	12	148	142320.9355	119.87476
2010	12	149	142516.2258	122.64513
2010	12	150	142701.3871	125.35543
2010	12	151	142864.2258	127.80829
2010	12	152	143033.9677	130.43617
2010	12	153	143145.8387	132.20873

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	154	143318.4194	135.00811
2010	12	155	143393.9032	136.25776
2010	12	156	143491.3548	137.89424
2010	12	157	143586.2258	139.51284
2010	12	158	143757.1935	142.49437
2010	12	159	143839.5161	143.96025
2010	12	160	143872.9032	144.56044
2010	12	161	143917.8387	145.37347
2010	12	162	143960.0645	146.14298
2010	12	163	144014.1613	147.13668
2010	12	164	144073.4194	148.2354
2010	12	165	144141.1935	149.50524
2010	12	166	144190.9355	150.44628
2010	12	167	144210.7742	150.82376
2010	12	168	144889.871	164.51814
2010	12	169	144907.6129	164.89686
2010	12	170	144974.7419	166.33986
2010	12	171	145062.1935	168.24381
2010	12	172	145737.2581	183.90181
2010	12	173	145825.9677	186.09193
2010	12	174	145855.5806	186.83019
2010	12	175	145867.2581	187.12231
2010	12	176	145904.0968	188.04753
2010	12	177	145934.7742	188.82231
2010	12	178	145956.0645	189.36231
2010	12	179	146306.6774	198.5332
2010	12	180	146330.6452	199.17967
2010	12	181	146336.3548	199.33406
2010	12	182	146347.6774	199.64064
2010	12	183	146366.6129	200.15463
2010	12	184	146409.4194	201.32251
2010	12	185	146446.4516	202.33952
2010	12	186	146455.9032	202.60008
2010	12	187	146465.5161	202.86551
2010	12	188	146500.3871	203.83189
2010	12	189	146521.129	204.40934
2010	12	190	146523.0645	204.46333
2010	12	191	146530.9032	204.68214
2010	12	192	146548.8065	205.18297
2010	12	193	146579.1613	206.0355
2010	12	194	146614.3548	207.02928
2010	12	195	146697.1935	209.39131
2010	12	196	146775.4194	211.6516
2010	12	197	146825.7742	213.12206
2010	12	198	146857.4839	214.05433
2010	12	199	146942.4516	216.57654
2010	12	200	147035.6774	219.38481
2010	12	201	147096.871	221.25176
2010	12	202	147146.2903	222.77328
2010	12	203	147215.4516	224.92354
2010	12	204	147272.4194	226.71319

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	205	147357.8065	229.42729
2010	12	206	147385.4194	230.31319
2010	12	207	147438.7419	232.03539
2010	12	208	147451.0323	232.43449
2010	12	209	147471.6129	233.10461
2010	12	210	147512.7742	234.45168
2010	12	211	147517.1613	234.5958
2010	12	212	147528.2581	234.96079
2010	12	213	147539.9032	235.34454
2010	12	214	147549.3226	235.65548
2010	12	215	147549.871	235.67359
2010	12	216	147556.6129	235.89647
2010	12	217	147560.0968	236.01173
2010	12	218	147566.7097	236.2307
2010	12	219	147570.0968	236.34295
2010	12	220	147570.4194	236.35365
2010	12	221	147578.2581	236.61368
2010	12	222	147588.1935	236.94375
2010	12	223	147591.2581	237.04566
2010	12	224	147591.8065	237.06391
2010	12	225	147592.3871	237.08322
2010	12	226	147595.4516	237.18521
2010	12	227	147605.9355	237.5345
2010	12	228	147634.9355	238.50385
2010	12	229	147722.7097	241.46614
2010	12	230	147774.1613	243.2226
2010	12	231	147774.8387	243.24583
2010	12	232	147781.6774	243.48044
2010	12	233	147799.2258	244.08367
2010	12	234	147799.2258	244.08367
2010	12	235	147818.5806	244.75102
2010	12	236	147840.8387	245.52111
2010	12	237	147840.8387	245.52111
2010	12	238	147840.8387	245.52111
2010	12	239	147869.6774	246.52309
2010	12	240	147881.6774	246.94143
2010	12	241	147891.2258	247.27489
2010	12	242	147905.2903	247.76703
2010	12	243	147905.2903	247.76703
2010	12	244	147911.2903	247.97732
2010	12	245	147972.1613	250.1226
2010	12	246	147986.6129	250.63508
2010	12	247	147997.2581	251.01336
2010	12	248	148003.8065	251.2464
2010	12	249	148003.8065	251.2464
2010	12	250	148040.9677	252.57359
2010	12	251	148048.4194	252.8407
2010	12	252	148112.2258	255.14137
2010	12	253	148126.5161	255.65996
2010	12	254	148180.5806	257.63303
2010	12	255	148184.2903	257.76906

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	256	148185.0968	257.79864
2010	12	257	148185.9355	257.82941
2010	12	258	148197.4839	258.25353
2010	12	259	148232.0968	259.52952
2010	12	260	148293.0645	261.79486
2010	12	261	148306.871	262.31102
2010	12	262	148315.8387	262.64692
2010	12	263	148352.8065	264.03683
2010	12	264	148389.129	265.41076
2010	12	265	148453.6452	267.8715
2010	12	266	148510.871	270.07617
2010	12	267	148543.9677	271.36077
2010	12	268	148563.9677	272.14045
2010	12	269	148575.3226	272.58424
2010	12	270	148625.2258	274.54456
2010	12	271	148692.8387	277.2264
2010	12	272	148784.9355	280.92777
2010	12	273	148825.4516	282.574
2010	12	274	148836.1935	283.0123
2010	12	275	148849.0645	283.5385
2010	12	276	148865.129	284.19683
2010	12	277	148875.3871	284.61812
2010	12	278	148906.0968	285.8836
2010	12	279	148913.6452	286.19564
2010	12	280	148921.6129	286.52543
2010	12	281	148929.1935	286.8396
2010	12	282	148938.9032	287.24258
2010	12	283	148998.1613	289.716
2010	12	284	149010.3548	290.22796
2010	12	285	149020.1613	290.64044
2010	12	286	149035.6452	291.29308
2010	12	287	149045.3548	291.7032
2010	12	288	149078.0323	293.08824
2010	12	289	149080.7419	293.20342
2010	12	290	149090.5806	293.62209
2010	12	291	149096.871	293.89012
2010	12	292	149105.0968	294.24104
2010	12	293	149118.4516	294.81177
2010	12	294	149192.2258	297.98735
2010	12	295	149200.3871	298.34103
2010	12	296	149214.5806	298.95725
2010	12	297	149235.5161	299.86882
2010	12	298	149258.0323	300.85272
2010	12	299	149273.871	301.54703
2010	12	300	149355.4839	305.15348
2010	12	301	149398.4839	307.07324
2010	12	302	149405.2581	307.37692
2010	12	303	149425.7419	308.29725
2010	12	304	149451.7097	309.46844
2010	12	305	149467.1935	310.16919
2010	12	306	149535.1613	313.26638

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	307	149551.3548	314.00943
2010	12	308	149593.3548	315.94589
2010	12	309	149617.6452	317.07195
2010	12	310	149659.2581	319.01157
2010	12	311	149717.8065	321.76318
2010	12	312	149746.8387	323.13749
2010	12	313	149770.5484	324.26474
2010	12	314	149802.5161	325.79158
2010	12	315	149830.2581	327.12313
2010	12	316	149847.2581	327.94211
2010	12	317	149890.0968	330.01606
2010	12	318	149910.7097	331.01922
2010	12	319	149931.0323	332.0116
2010	12	320	149955.4516	333.20843
2010	12	321	149989.6452	334.89242
2010	12	322	150017.5806	336.27527
2010	12	323	150040.7419	337.42662
2010	12	324	150096.1613	340.19943
2010	12	325	150131.4194	341.97673
2010	12	326	150161.6452	343.50861
2010	12	327	150188.2258	344.86206
2010	12	328	150229.9677	346.99951
2010	12	329	150258.871	348.48817
2010	12	330	150294.4839	350.33219
2010	12	331	150317.0323	351.50535
2010	12	332	150352.2581	353.34683
2010	12	333	150363.8387	353.95456
2010	12	334	150369.9355	354.27498
2010	12	335	150409.4516	356.35957
2010	12	336	150421.1935	356.98161
2010	12	337	150437.5161	357.84832
2010	12	338	150458.9677	358.99092
2010	12	339	150475.7742	359.88893
2010	12	340	150493	360.81193
2010	12	341	150502.9032	361.34375
2010	12	342	150513.5806	361.91813
2010	12	343	150534.1935	363.02983
2010	12	344	150542.0968	363.45707
2010	12	345	150549.0968	363.83595
2010	12	346	150565.2581	364.71235
2010	12	347	150587.0968	365.90036
2010	12	348	150614.129	367.37682
2010	12	349	150631.6774	368.33881
2010	12	350	150648.6774	369.27339
2010	12	351	150680.2581	371.01652
2010	12	352	150689.8065	371.54534
2010	12	353	150696.6774	371.9264
2010	12	354	150705	372.38853
2010	12	355	150732.3871	373.91376
2010	12	356	150737.2903	374.18755
2010	12	357	150746.7742	374.71776

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	358	150846.9032	380.36642
2010	12	359	150855.3226	380.84565
2010	12	360	150894.8387	383.10381
2010	12	361	150917.6452	384.41379
2010	12	362	150937.7097	385.57036
2010	12	363	150953.6129	386.48979
2010	12	364	150965.2903	387.16644
2010	12	365	150981.3871	388.1013
2010	12	366	150987.0645	388.43163
2010	12	367	151011.2581	389.84273
2010	12	368	151050.2258	392.1274
2010	12	369	151073.6452	393.50755
2010	12	370	151207.9355	401.5252
2010	12	371	151228.3226	402.75797
2010	12	372	151257.0968	404.50496
2010	12	373	151269.3548	405.25171
2010	12	374	151280.871	405.95464
2010	12	375	151293.9355	406.7537
2010	12	376	151311.4839	407.82971
2010	12	377	151326.3226	408.74201
2010	12	378	151344.4194	409.85763
2010	12	379	151363.7742	411.0545
2010	12	380	151380.7097	412.1049
2010	12	381	151402.0323	413.43158
2010	12	382	151427.5484	415.02531
2010	12	383	151574.7742	424.35304
2010	12	384	151591.8387	425.44889
2010	12	385	151605.7419	426.34402
2010	12	386	151630	427.91073
2010	12	387	151654.3871	429.4921
2010	12	388	151670.5161	430.54148
2010	12	389	151680.6129	431.19981
2010	12	390	151696.2258	432.21996
2010	12	391	151711.2903	433.20677
2010	12	392	151754.3871	436.04342
2010	12	393	151766.9355	436.87315
2010	12	394	151793.1613	438.61282
2010	12	395	151807.5484	439.57038
2010	12	396	151821.3871	440.49358
2010	12	397	151840.6129	441.77967
2010	12	398	151859.0323	443.01563
2010	12	399	151885.7742	444.81674
2010	12	400	151903.5484	446.01826
2010	12	401	151911.0968	446.52959
2010	12	402	151942.4516	448.66039
2010	12	403	151954.4839	449.481
2010	12	404	152049.7742	456.03767
2010	12	405	152067.129	457.24293
2010	12	406	152079.6129	458.11204
2010	12	407	152083.1613	458.35941
2010	12	408	152087.3226	458.64968

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	409	152091.4839	458.94015
2010	12	410	152102.4839	459.70894
2010	12	411	152135.9032	462.0532
2010	12	412	152170.5806	464.4994
2010	12	413	152177.2581	464.97204
2010	12	414	152180.9032	465.23027
2010	12	415	152184.0323	465.45206
2010	12	416	152188.9032	465.79755
2010	12	417	152203.5806	466.84028
2010	12	418	152243.9355	469.72024
2010	12	419	152247.0323	469.94203
2010	12	420	152250.1935	470.16857
2010	12	421	152283.4194	472.55663
2010	12	422	152288.3548	472.91248
2010	12	423	152291.5806	473.14522
2010	12	424	152480.5484	486.99712
2010	12	425	152485.9355	487.39837
2010	12	426	152492.0323	487.85291
2010	12	427	152512.0968	489.35202
2010	12	428	152524.1613	490.2558
2010	12	429	152530.3548	490.72048
2010	12	430	152535.4516	491.10322
2010	12	431	152538.2581	491.31411
2010	12	432	152538.2581	491.31411
2010	12	433	152541.0645	491.52509
2010	12	434	152552.2903	492.37001
2010	12	435	152552.2903	492.37001
2010	12	436	152571.3548	493.8085
2010	12	437	152574.0645	494.01333
2010	12	438	152595.8065	495.6601
2010	12	439	152688.8065	502.77105
2010	12	440	152694.2258	503.1888
2010	12	441	152694.2258	503.1888
2010	12	442	152694.2258	503.1888
2010	12	443	152694.2258	503.1888
2010	12	444	152694.2258	503.1888
2010	12	445	152694.2581	503.19129
2010	12	446	152694.2581	503.19129
2010	12	447	152694.2581	503.19129
2010	12	448	152694.3226	503.19626
2010	12	449	152694.3226	503.19626
2010	12	450	152712.3226	504.58647
2010	12	451	152712.3226	504.58647
2010	12	452	152712.3226	504.58647
2010	12	453	152712.3226	504.58647
2010	12	454	152712.3226	504.58647
2010	12	455	152712.3226	504.58647
2010	12	456	152712.3226	504.58647
2010	12	457	152712.3871	504.59146
2010	12	458	152712.3871	504.59146
2010	12	459	152712.3871	504.59146

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	460	152712.4194	504.59395
2010	12	461	152712.4194	504.59395
2010	12	462	152751.4194	507.6203
2010	12	463	152751.4194	507.6203
2010	12	464	152751.4194	507.6203
2010	12	465	152769.4194	509.02365
2010	12	466	152774.8065	509.44446
2010	12	467	152774.8065	509.44446
2010	12	468	152774.8065	509.44446
2010	12	469	152774.8065	509.44446
2010	12	470	152807.2581	511.9873
2010	12	471	152817.2581	512.77363
2010	12	472	152822.6452	513.19777
2010	12	473	152822.6452	513.19777
2010	12	474	152822.6452	513.19777
2010	12	475	152880.3871	517.76765
2010	12	476	152885.4194	518.16798
2010	12	477	152885.4194	518.16798
2010	12	478	152885.4194	518.16798
2010	12	479	152890.4194	518.56607
2010	12	480	152890.4194	518.56607
2010	12	481	152917.4194	520.72146
2010	12	482	152967.3871	524.73573
2010	12	483	152967.3871	524.73573
2010	12	484	152972.3871	525.13924
2010	12	485	152990.9355	526.63903
2010	12	486	153005.9677	527.85788
2010	12	487	153016.0645	528.67825
2010	12	488	153016.0645	528.67825
2010	12	489	153016.0645	528.67825
2010	12	490	153016.0645	528.67825
2010	12	491	153051.2258	531.54579
2010	12	492	153051.2258	531.54579
2010	12	493	153053.2581	531.71204
2010	12	494	153053.2581	531.71204
2010	12	495	153055.3226	531.88098
2010	12	496	153056	531.93643
2010	12	497	153081	533.98702
2010	12	498	153117	536.95475
2010	12	499	153117	536.95475
2010	12	500	153117	536.95475
2010	12	501	153117	536.95475
2010	12	502	153118.3548	537.06678
2010	12	503	153118.3548	537.06678
2010	12	504	153120.3871	537.23488
2010	12	505	153121.0968	537.29359
2010	12	506	153121.7742	537.34964
2010	12	507	153122.4516	537.4057
2010	12	508	153123.129	537.46177
2010	12	509	153123.8065	537.51784
2010	12	510	153123.8065	537.51784

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	511	153123.8065	537.51784
2010	12	512	153123.8065	537.51784
2010	12	513	153124.4839	537.57391
2010	12	514	153127.6774	537.83835
2010	12	515	153139.6129	538.82791
2010	12	516	153151.0645	539.77918
2010	12	517	153166.4839	541.06289
2010	12	518	153184.6774	542.58175
2010	12	519	153210.871	544.7765
2010	12	520	153225.0968	545.97245
2010	12	521	153238.0645	547.06508
2010	12	522	153249	547.98829
2010	12	523	153256	548.58013
2010	12	524	153263.5484	549.2191
2010	12	525	153270.8387	549.83698
2010	12	526	153277.6774	550.41726
2010	12	527	153288	551.29439
2010	12	528	153296	551.97519
2010	12	529	153300.871	552.39016
2010	12	530	153306.3226	552.85498
2010	12	531	153310.3871	553.2018
2010	12	532	153313.0968	553.43315
2010	12	533	153314.2903	553.53509
2010	12	534	153315.3871	553.62877
2010	12	535	153315.6129	553.64806
2010	12	536	153327.4194	554.6577
2010	12	537	153328.7742	554.77368
2010	12	538	153338.9032	555.64163
2010	12	539	153348.3548	556.45284
2010	12	540	153348.3548	556.45284
2010	12	541	153348.3548	556.45284
2010	12	542	153348.3548	556.45284
2010	12	543	153349.0323	556.51103
2010	12	544	153349.7097	556.56923
2010	12	545	153353.4194	556.88804
2010	12	546	153357.129	557.20704
2010	12	547	153357.129	557.20704
2010	12	548	153384.3548	559.55423
2010	12	549	153406.6452	561.48378
2010	12	550	153411.2903	561.88678
2010	12	551	153421.0323	562.73296
2010	12	552	153421.7097	562.79185
2010	12	553	153425.4194	563.11446
2010	12	554	153425.4194	563.11446
2010	12	555	153431.6129	563.65352
2010	12	556	153448.6452	565.13879
2010	12	557	153462.3226	566.33453
2010	12	558	153478.4194	567.74523
2010	12	559	153501.6129	569.78448
2010	12	560	153517.3871	571.17585
2010	12	561	153522.8065	571.6547

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	562	153522.8065	571.6547
2010	12	563	153541.6774	573.32548
2010	12	564	153548.4839	573.92938
2010	12	565	153548.4839	573.92938
2010	12	566	153570.2903	575.86871
2010	12	567	153600.3226	578.55102
2010	12	568	153613.4839	579.7307
2010	12	569	153621.2258	580.42583
2010	12	570	153621.2258	580.42583
2010	12	571	153626.6452	580.91295
2010	12	572	153631.2903	581.33082
2010	12	573	153662.7097	584.16569
2010	12	574	153666.4194	584.50138
2010	12	575	153666.4194	584.50138
2010	12	576	153688.2258	586.47876
2010	12	577	153706.5806	588.14867
2010	12	578	153712	588.64269
2010	12	579	153744.8065	591.64268
2010	12	580	153751.9677	592.29971
2010	12	581	153760.5161	593.08501
2010	12	582	153768.4516	593.815
2010	12	583	153780.0645	594.885
2010	12	584	153782.3871	595.09925
2010	12	585	153786.0968	595.44161
2010	12	586	153786.0968	595.44161
2010	12	587	153803.1935	597.02219
2010	12	588	153822.871	598.84686
2010	12	589	153850.8387	601.4505
2010	12	590	153850.8387	601.4505
2010	12	591	153855.6774	601.90217
2010	12	592	153855.6774	601.90217
2010	12	593	153866.7097	602.93333
2010	12	594	153879.129	604.09639
2010	12	595	153889.2258	605.0437
2010	12	596	153890.7742	605.18911
2010	12	597	153890.7742	605.18911
2010	12	598	153890.7742	605.18911
2010	12	599	153905.2903	606.55417
2010	12	600	153914.9677	607.46602
2010	12	601	153922.9032	608.21483
2010	12	602	153929.2903	608.81824
2010	12	603	153937.6452	609.6085
2010	12	604	153937.6452	609.6085
2010	12	605	153939.1935	609.75508
2010	12	606	153944.0323	610.21338
2010	12	607	153964.9355	612.19743
2010	12	608	153964.9355	612.19743
2010	12	609	154019.8065	617.43819
2010	12	610	154019.8065	617.43819
2010	12	611	154019.8065	617.43819
2010	12	612	154019.8065	617.43819

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	613	154024.4516	617.88403
2010	12	614	154030.8387	618.49762
2010	12	615	154033.9355	618.79535
2010	12	616	154035.4839	618.94427
2010	12	617	154035.4839	618.94427
2010	12	618	154040	619.37885
2010	12	619	154040	619.37885
2010	12	620	154040	619.37885
2010	12	621	154047.7419	620.12458
2010	12	622	154047.7419	620.12458
2010	12	623	154047.7419	620.12458
2010	12	624	154047.7419	620.12458
2010	12	625	154047.7419	620.12458
2010	12	626	154047.7419	620.12458
2010	12	627	154047.7419	620.12458
2010	12	628	154049.2903	620.27385
2010	12	629	154049.2903	620.27385
2010	12	630	154049.2903	620.27385
2010	12	631	154049.2903	620.27385
2010	12	632	154050.7097	620.4107
2010	12	633	154052.5484	620.58804
2010	12	634	154052.9032	620.62227
2010	12	635	154052.9032	620.62227
2010	12	636	154052.9032	620.62227
2010	12	637	154052.9032	620.62227
2010	12	638	154052.9032	620.62227
2010	12	639	154052.9032	620.62227
2010	12	640	154053.6129	620.69073
2010	12	641	154053.6129	620.69073
2010	12	642	154055.0323	620.82769
2010	12	643	154055.0323	620.82769
2010	12	644	154055.0323	620.82769
2010	12	645	154060.129	621.31974
2010	12	646	154060.129	621.31974
2010	12	647	154061.7097	621.47242
2010	12	648	154063.6452	621.65944
2010	12	649	154063.6452	621.65944
2010	12	650	154065.2258	621.81221
2010	12	651	154065.5806	621.84651
2010	12	652	154067.1613	621.99933
2010	12	653	154067.1613	621.99933
2010	12	654	154067.1613	621.99933
2010	12	655	154070.1613	622.28949
2010	12	656	154074.9032	622.74841
2010	12	657	154074.9032	622.74841
2010	12	658	154075.2581	622.78277
2010	12	659	154075.2581	622.78277
2010	12	660	154083.1613	623.54848
2010	12	661	154084.7419	623.70175
2010	12	662	154087.7419	623.99275
2010	12	663	154087.7419	623.99275

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	664	154090.9032	624.29954
2010	12	665	154092.4839	624.453
2010	12	666	154092.4839	624.453
2010	12	667	154094.0645	624.6065
2010	12	668	154094.0645	624.6065
2010	12	669	154094.4194	624.64097
2010	12	670	154094.4194	624.64097
2010	12	671	154094.4194	624.64097
2010	12	672	154094.4194	624.64097
2010	12	673	154094.7742	624.67543
2010	12	674	154094.7742	624.67543
2010	12	675	154094.7742	624.67543
2010	12	676	154101.0968	625.2899
2010	12	677	154102.6774	625.44362
2010	12	678	154102.6774	625.44362
2010	12	679	154102.6774	625.44362
2010	12	680	154104.2581	625.59737
2010	12	681	154109	626.05888
2010	12	682	154109	626.05888
2010	12	683	154109	626.05888
2010	12	684	154109	626.05888
2010	12	685	154109	626.05888
2010	12	686	154109	626.05888
2010	12	687	154109	626.05888
2010	12	688	154109	626.05888
2010	12	689	154109	626.05888
2010	12	690	154109	626.05888
2010	12	691	154109	626.05888
2010	12	692	154181	633.1108
2010	12	693	154181	633.1108
2010	12	694	154181	633.1108
2010	12	695	154181	633.1108
2010	12	696	154181	633.1108
2010	12	697	154181	633.1108
2010	12	698	154181	633.1108
2010	12	699	154181	633.1108
2010	12	700	154181	633.1108
2010	12	701	154181	633.1108
2010	12	702	154181	633.1108
2010	12	703	154181	633.1108
2010	12	704	154181	633.1108
2010	12	705	154181	633.1108
2010	12	706	154181	633.1108
2010	12	707	154181	633.1108
2010	12	708	154181	633.1108
2010	12	709	154181	633.1108
2010	12	710	154181	633.1108
2010	12	711	154181	633.1108
2010	12	712	154181	633.1108
2010	12	713	154181	633.1108
2010	12	714	154181	633.1108

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	715	154181	633.1108
2010	12	716	154181	633.1108
2010	12	717	154181	633.1108
2010	12	718	154181	633.1108
2010	12	719	154181	633.1108
2010	12	720	154181	633.1108
2010	12	721	154181	633.1108
2010	12	722	154181	633.1108
2010	12	723	154181	633.1108
2010	12	724	154181	633.1108
2010	12	725	154181	633.1108
2010	12	726	154181	633.1108
2010	12	727	154181	633.1108
2010	12	728	154181	633.1108
2010	12	729	154181	633.1108
2010	12	730	154181	633.1108
2010	12	731	154181	633.1108
2010	12	732	154181	633.1108
2010	12	733	154181	633.1108
2010	12	734	154181	633.1108
2010	12	735	154181	633.1108
2010	12	736	154181	633.1108
2010	12	737	154181	633.1108
2010	12	738	154241	639.05165
2010	12	739	154241	639.05165
2010	12	740	154241	639.05165
2010	12	741	154241	639.05165
2010	12	742	154241	639.05165
2010	12	743	154241	639.05165
2010	12	744	154241	639.05165
2010	12	745	154241	639.05165
2010	12	746	154241	639.05165
2010	12	747	154241	639.05165
2010	12	748	154241	639.05165
2010	12	749	154241	639.05165
2010	12	750	154313	646.25863
2010	12	751	154313	646.25863
2010	12	752	154313	646.25863
2010	12	753	154313	646.25863
2010	12	754	154313	646.25863
2010	12	755	154313	646.25863
2010	12	756	154313	646.25863
2010	12	757	154313	646.25863
2010	12	758	154313	646.25863
2010	12	759	154313	646.25863
2010	12	760	154313	646.25863
2010	12	761	155182.5161	740.39432
2010	12	762	155182.5161	740.39432
2010	12	763	155182.5161	740.39432
2010	12	764	155182.5161	740.39432
2010	12	765	155182.5161	740.39432

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	766	155182.5161	740.39432
2010	12	767	155182.5161	740.39432
2010	12	768	155182.5161	740.39432
2010	12	769	155182.5161	740.39432
2010	12	770	155182.5161	740.39432
2010	12	771	155182.5161	740.39432
2010	12	772	155182.5161	740.39432
2010	12	773	155182.5161	740.39432
2010	12	774	155182.5161	740.39432
2010	12	775	155182.5161	740.39432
2010	12	776	155182.5161	740.39432
2010	12	777	155182.5161	740.39432
2010	12	778	155182.5161	740.39432
2010	12	779	155182.5161	740.39432
2010	12	780	155182.5161	740.39432
2010	12	781	155182.5161	740.39432
2010	12	782	155182.5161	740.39432
2010	12	783	155182.5161	740.39432
2010	12	784	155182.5161	740.39432
2010	12	785	155182.5161	740.39432
2010	12	786	155182.5161	740.39432
2010	12	787	155182.5161	740.39432
2010	12	788	155182.5161	740.39432
2010	12	789	155182.5161	740.39432
2010	12	790	155182.5161	740.39432
2010	12	791	155182.5161	740.39432
2010	12	792	155182.5161	740.39432
2010	12	793	155213.5161	744.00582
2010	12	794	155213.5161	744.00582
2010	12	795	155213.5161	744.00582
2010	12	796	155213.5161	744.00582
2010	12	797	155213.5161	744.00582
2010	12	798	155213.5161	744.00582
2010	12	799	155213.5161	744.00582
2010	12	800	155213.5161	744.00582
2010	12	801	155213.5161	744.00582
2010	12	802	155213.5161	744.00582
2010	12	803	155213.5161	744.00582
2010	12	804	155213.5161	744.00582
2010	12	805	155213.5161	744.00582
2010	12	806	155213.5161	744.00582
2010	12	807	155249.5161	748.22303
2010	12	808	155249.5161	748.22303
2010	12	809	155249.5161	748.22303
2010	12	810	155249.5161	748.22303
2010	12	811	155249.5161	748.22303
2010	12	812	155249.5161	748.22303
2010	12	813	155249.5161	748.22303
2010	12	814	155249.5161	748.22303
2010	12	815	155249.5161	748.22303
2010	12	816	155249.5161	748.22303

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	817	155249.5161	748.22303
2010	12	818	155249.5161	748.22303
2010	12	819	155249.5161	748.22303
2010	12	820	155249.9032	748.26852
2010	12	821	155249.9032	748.26852
2010	12	822	155249.9032	748.26852
2010	12	823	155249.9032	748.26852
2010	12	824	155249.9032	748.26852
2010	12	825	155249.9032	748.26852
2010	12	826	155249.9032	748.26852
2010	12	827	155249.9032	748.26852
2010	12	828	155250.6774	748.35949
2010	12	829	155251	748.3974
2010	12	830	155251.1935	748.42015
2010	12	831	155251.3871	748.44289
2010	12	832	155251.3871	748.44289
2010	12	833	155251.3871	748.44289
2010	12	834	155251.3871	748.44289
2010	12	835	155251.3871	748.44289
2010	12	836	155253.1935	748.65523
2010	12	837	155253.1935	748.65523
2010	12	838	155253.1935	748.65523
2010	12	839	155254.1613	748.76902
2010	12	840	155254.1613	748.76902
2010	12	841	155254.3548	748.79177
2010	12	842	155254.5484	748.81453
2010	12	843	155254.9355	748.86005
2010	12	844	155254.9355	748.86005
2010	12	845	155254.9355	748.86005
2010	12	846	155254.9355	748.86005
2010	12	847	155254.9355	748.86005
2010	12	848	155254.9355	748.86005
2010	12	849	155254.9355	748.86005
2010	12	850	155254.9355	748.86005
2010	12	851	155254.9355	748.86005
2010	12	852	155254.9355	748.86005
2010	12	853	155254.9355	748.86005
2010	12	854	155254.9355	748.86005
2010	12	855	155254.9355	748.86005
2010	12	856	155254.9355	748.86005
2010	12	857	155254.9355	748.86005
2010	12	858	155254.9355	748.86005
2010	12	859	155254.9355	748.86005
2010	12	860	155254.9355	748.86005
2010	12	861	155254.9355	748.86005
2010	12	862	155254.9355	748.86005
2010	12	863	155254.9355	748.86005
2010	12	864	155254.9355	748.86005
2010	12	865	155290.9355	753.10615
2010	12	866	155290.9355	753.10615
2010	12	867	155290.9355	753.10615

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	868	155290.9355	753.10615
2010	12	869	155290.9355	753.10615
2010	12	870	155290.9355	753.10615
2010	12	871	155290.9355	753.10615
2010	12	872	155290.9355	753.10615
2010	12	873	155290.9355	753.10615
2010	12	874	155290.9355	753.10615
2010	12	875	155295.5806	753.65587
2010	12	876	155298.6774	754.02258
2010	12	877	155298.6774	754.02258
2010	12	878	155300.2258	754.20601
2010	12	879	155301.7742	754.38948
2010	12	880	155301.7742	754.38948
2010	12	881	155303.3226	754.573
2010	12	882	155307.9677	755.12385
2010	12	883	155317.4516	756.2498
2010	12	884	155328.3548	757.54643
2010	12	885	155333.0645	758.10723
2010	12	886	155339.3226	758.85309
2010	12	887	155345.5806	759.59971
2010	12	888	155345.5806	759.59971
2010	12	889	155350.2903	760.16211
2010	12	890	155359.7742	761.29594
2010	12	891	155359.7742	761.29594
2010	12	892	155359.7742	761.29594
2010	12	893	155378.7419	763.56892
2010	12	894	155388.0968	764.69256
2010	12	895	155394.3871	765.44909
2010	12	896	155399.129	766.01991
2010	12	897	155408.4839	767.14734
2010	12	898	155408.4839	767.14734
2010	12	899	155408.4839	767.14734
2010	12	900	155408.4839	767.14734
2010	12	901	155408.4839	767.14734
2010	12	902	155408.4839	767.14734
2010	12	903	155424.2903	769.05625
2010	12	904	155424.2903	769.05625
2010	12	905	155427.4516	769.43863
2010	12	906	155436.9355	770.58697
2010	12	907	155436.9355	770.58697
2010	12	908	155436.9355	770.58697
2010	12	909	155436.9355	770.58697
2010	12	910	155436.9355	770.58697
2010	12	911	155436.9355	770.58697
2010	12	912	155436.9355	770.58697
2010	12	913	155436.9355	770.58697
2010	12	914	155436.9355	770.58697
2010	12	915	155436.9355	770.58697
2010	12	916	155436.9355	770.58697
2010	12	917	155436.9355	770.58697
2010	12	918	155441.871	771.18528

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	919	155441.871	771.18528
2010	12	920	155450.0968	772.18355
2010	12	921	155451.7419	772.38337
2010	12	922	155455.0323	772.78317
2010	12	923	155495.9677	777.77526
2010	12	924	155498.7097	778.11084
2010	12	925	155504.1935	778.78247
2010	12	926	155505.8387	778.98407
2010	12	927	155512.9677	779.85833
2010	12	928	155512.9677	779.85833
2010	12	929	155525.0323	781.34018
2010	12	930	155541.4839	783.36564
2010	12	931	155544.7742	783.77139
2010	12	932	155550.8065	784.51584
2010	12	933	155553	784.78673
2010	12	934	155555.1935	785.05772
2010	12	935	155555.7419	785.12549
2010	12	936	155556.8387	785.26103
2010	12	937	155557.3871	785.32881
2010	12	938	155563.9677	786.14266
2010	12	939	155572.1935	787.16122
2010	12	940	155572.1935	787.16122
2010	12	941	155573.8387	787.3651
2010	12	942	155577.129	787.77302
2010	12	943	155585.9032	788.86189
2010	12	944	155589.7419	789.33876
2010	12	945	155602.3226	790.90375
2010	12	946	155602.871	790.97204
2010	12	947	155609.5484	791.80408
2010	12	948	155617.0968	792.74575
2010	12	949	155618.3548	792.90281
2010	12	950	155622.9677	793.47897
2010	12	951	155623.3871	793.53137
2010	12	952	155631.3548	794.52766
2010	12	953	155640.5806	795.68289
2010	12	954	155641	795.73544
2010	12	955	155641	795.73544
2010	12	956	155656.5161	797.68243
2010	12	957	155677.0645	800.26855
2010	12	958	155682.9355	801.00905
2010	12	959	155684.6129	801.22076
2010	12	960	155689.2258	801.80324
2010	12	961	155691.3226	802.06815
2010	12	962	155691.7419	802.12115
2010	12	963	155692.5806	802.22715
2010	12	964	155693	802.28015
2010	12	965	155703.4839	803.60645
2010	12	966	155710.1935	804.45649
2010	12	967	155712.7097	804.7755
2010	12	968	155714.3871	804.98824
2010	12	969	155714.3871	804.98824

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2010	12	970	155719.4194	805.62683
2010	12	971	155727.8065	806.69232
2010	12	972	155733.2581	807.38567
2010	12	973	155733.2581	807.38567
2010	12	974	155733.6774	807.43903
2010	12	975	155734.9355	807.59914
2010	12	976	155734.9355	807.59914
2010	12	977	155734.9355	807.59914
2010	12	978	155734.9355	807.59914
2010	12	979	155734.9355	807.59914
2010	12	980	155734.9355	807.59914
2010	12	981	155775.9355	812.83513
2010	12	982	155775.9355	812.83513
2010	12	983	155777.5806	813.04596
2010	12	984	155777.5806	813.04596
2010	12	985	155778.6774	813.18655
2010	12	986	155779.2258	813.25686
2010	12	987	155779.2258	813.25686
2010	12	988	155779.7742	813.32717
2010	12	989	155779.7742	813.32717
2010	12	990	155779.7742	813.32717
2010	12	991	155781.4194	813.53814
2010	12	992	155781.9677	813.60848
2010	12	993	155781.9677	813.60848
2010	12	994	155781.9677	813.60848
2010	12	995	155781.9677	813.60848
2010	12	996	155785.8065	814.10101
2010	12	997	155786.9032	814.24179
2010	12	998	155841.7419	821.31337
2010	12	999	155842.7097	821.43874

January 2011

Net Benefit Tab

Effective_month	Test_result
1/1/2011 0:00	\$40.27

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.723842196	1.194510591

Curve Parameters Tab

a	b	c	d
2.419801034	0.000153878	16.85671061	37.72883012

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	1	21180.70968	37.72884
2011	1	2	21576.16129	37.72884
2011	1	3	21576.48387	37.72884
2011	1	4	23016.12903	37.72884
2011	1	5	26635.41935	37.72884
2011	1	6	31395.19355	37.72885
2011	1	7	33507.03226	37.72886
2011	1	8	33687.58065	37.72886
2011	1	9	34564.77419	37.72887
2011	1	10	34571.93548	37.72887
2011	1	11	34617.03226	37.72887
2011	1	12	34643.22581	37.72887
2011	1	13	34852.58065	37.72887
2011	1	14	34852.6129	37.72887
2011	1	15	37096.35484	37.72888
2011	1	16	37338.35484	37.72888
2011	1	17	37383.51613	37.72888
2011	1	18	37559.87097	37.72889
2011	1	19	37639.35484	37.72889
2011	1	20	38372.41935	37.72889
2011	1	21	38617.29032	37.7289
2011	1	22	40816.51613	37.72892
2011	1	23	43705.70968	37.72896
2011	1	24	46000.3871	37.72901
2011	1	25	49058.6129	37.7291
2011	1	26	52296.22581	37.72925
2011	1	27	56024.54839	37.72952
2011	1	28	60623.80645	37.73013
2011	1	29	65922.67742	37.7315
2011	1	30	72631.74194	37.73549
2011	1	31	77495.25806	37.74174
2011	1	32	81413.96774	37.75083
2011	1	33	84902.25806	37.7642
2011	1	34	87677.22581	37.78043
2011	1	35	90212.80645	37.80169
2011	1	36	92098.96774	37.82301
2011	1	37	93423.48387	37.84162
2011	1	38	94694.06452	37.86291
2011	1	39	95699.64516	37.88257
2011	1	40	96509.12903	37.90047
2011	1	41	97689.70968	37.93039
2011	1	42	98623.93548	37.95771
2011	1	43	99543.3871	37.98822
2011	1	44	100496.9355	38.02416
2011	1	45	101854.9032	38.08411
2011	1	46	103249.1613	38.15834
2011	1	47	104387.3871	38.2303
2011	1	48	105479.1613	38.31063
2011	1	49	106573.6452	38.40407
2011	1	50	107227.8065	38.46694
2011	1	51	107596.5161	38.50492

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	52	108262.9677	38.5786
2011	1	53	108857.871	38.65026
2011	1	54	109531.0323	38.73866
2011	1	55	110030.6452	38.80971
2011	1	56	110522	38.88445
2011	1	57	110972.7097	38.95755
2011	1	58	113120.0323	39.37459
2011	1	59	113953.6129	39.57228
2011	1	60	114816.7419	39.80205
2011	1	61	115575	40.02741
2011	1	62	116105.1613	40.19937
2011	1	63	116756.2581	40.42827
2011	1	64	117471.8065	40.70436
2011	1	65	118014.0323	40.93223
2011	1	66	118685.6774	41.23882
2011	1	67	119686.8065	41.75114
2011	1	68	120268.4516	42.08246
2011	1	69	120785.3548	42.39974
2011	1	70	121177.3226	42.65566
2011	1	71	121525.7742	42.89492
2011	1	72	122135.5161	43.34188
2011	1	73	122828.6129	43.89709
2011	1	74	123317.1613	44.32113
2011	1	75	123735.6452	44.70746
2011	1	76	124193.7742	45.15639
2011	1	77	124660.9032	45.6439
2011	1	78	124850.9677	45.8513
2011	1	79	125143.9355	46.18167
2011	1	80	125529.8387	46.63745
2011	1	81	125780.0645	46.94604
2011	1	82	125973.871	47.19237
2011	1	83	126258.2258	47.56576
2011	1	84	126506.8387	47.90427
2011	1	85	126682.6452	48.15066
2011	1	86	126863.9355	48.41097
2011	1	87	126976.9355	48.57651
2011	1	88	127080.1613	48.72997
2011	1	89	127250.5161	48.98799
2011	1	90	127487.9032	49.35767
2011	1	91	127789.3871	49.8447
2011	1	92	127973.5161	50.15213
2011	1	93	128237.0968	50.60584
2011	1	94	128375.3548	50.85042
2011	1	95	128525.0645	51.1205
2011	1	96	128723.4194	51.48691
2011	1	97	128873.129	51.77009
2011	1	98	129184.9677	52.37878
2011	1	99	129420.0645	52.85507
2011	1	100	129640.5484	53.31581
2011	1	101	129864.0323	53.79715
2011	1	102	130087.2581	54.29276

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	103	130332.5161	54.85494
2011	1	104	130548.4194	55.3656
2011	1	105	131238.3226	57.10169
2011	1	106	131498.9677	57.80119
2011	1	107	131705.3548	58.37295
2011	1	108	132044.7097	59.34869
2011	1	109	132434.1935	60.52554
2011	1	110	132736.6452	61.48343
2011	1	111	133029.1613	62.44812
2011	1	112	133329.4839	63.47933
2011	1	113	133703.5484	64.82411
2011	1	114	134063.9355	66.18611
2011	1	115	135154.6452	70.73967
2011	1	116	135411.3548	71.91328
2011	1	117	135608.3548	72.84213
2011	1	118	136036.4839	74.94871
2011	1	119	136366.0645	76.6561
2011	1	120	136610.3871	77.97216
2011	1	121	136833.6774	79.2138
2011	1	122	137135.2258	80.95163
2011	1	123	137841.2903	85.31084
2011	1	124	137979.6129	86.21501
2011	1	125	138221.5484	87.83796
2011	1	126	138484.3226	89.6623
2011	1	127	138628.129	90.68866
2011	1	128	138710.1935	91.28343
2011	1	129	138813.6774	92.04297
2011	1	130	138911.5484	92.77122
2011	1	131	139001.4516	93.44878
2011	1	132	139158.3548	94.65134
2011	1	133	139206.871	95.02841
2011	1	134	139788.3871	99.74718
2011	1	135	139992.6129	101.49501
2011	1	136	140052.4194	102.01612
2011	1	137	140253.5484	103.80004
2011	1	138	140394.4194	105.07889
2011	1	139	140494.0968	105.99871
2011	1	140	140633.871	107.30974
2011	1	141	140848.7742	109.37472
2011	1	142	140989.7742	110.76276
2011	1	143	141067.871	111.54311
2011	1	144	141220.3871	113.09117
2011	1	145	141368.4194	114.62477
2011	1	146	141465.5806	115.64827
2011	1	147	141655.4194	117.68753
2011	1	148	141865.7419	120.00919
2011	1	149	142031.4839	121.88615
2011	1	150	142197.0323	123.80365
2011	1	151	142364.4516	125.78727
2011	1	152	142574.7097	128.34332
2011	1	153	142736.6452	130.3624

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	154	142822.9032	131.4562
2011	1	155	142998.4839	133.72272
2011	1	156	143131.7097	135.479
2011	1	157	143279.7419	137.46818
2011	1	158	143456.6774	139.89892
2011	1	159	143529.7097	140.91943
2011	1	160	143724.129	143.68609
2011	1	161	143863.6129	145.71658
2011	1	162	143975.9032	147.37945
2011	1	163	144100.4194	149.25332
2011	1	164	144165.6774	150.24816
2011	1	165	144241.5161	151.41545
2011	1	166	144315.6452	152.56813
2011	1	167	144372.8065	153.46494
2011	1	168	144469.9355	155.0049
2011	1	169	145148.9355	166.35808
2011	1	170	145191.4194	167.1039
2011	1	171	145279.6129	168.66602
2011	1	172	145376.0968	170.3966
2011	1	173	146075.7742	183.64983
2011	1	174	146154.8065	185.22773
2011	1	175	146304.8387	188.27025
2011	1	176	146356.5484	189.33335
2011	1	177	146448.8387	191.24944
2011	1	178	146534.0968	193.04105
2011	1	179	146601.0968	194.46364
2011	1	180	146690.3226	196.3784
2011	1	181	146815.4839	199.1038
2011	1	182	146899.6452	200.9627
2011	1	183	146948.6452	202.05483
2011	1	184	147031.2581	203.9127
2011	1	185	147109.871	205.70012
2011	1	186	147165.5161	206.97693
2011	1	187	147241.7742	208.7425
2011	1	188	147289.2903	209.85191
2011	1	189	147322.9355	210.64182
2011	1	190	147372.6774	211.81628
2011	1	191	147550.4516	216.07931
2011	1	192	147640.0645	218.26765
2011	1	193	147682.871	219.32243
2011	1	194	147689.5806	219.48832
2011	1	195	147707.0323	219.92051
2011	1	196	147730.4839	220.50289
2011	1	197	147784.2581	221.84534
2011	1	198	147843.9355	223.3467
2011	1	199	147884.2903	224.36888
2011	1	200	147960.5806	226.3167
2011	1	201	147997.3548	227.26286
2011	1	202	148374.4516	237.2433
2011	1	203	148422.129	238.54202
2011	1	204	148458.3226	239.53356

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	205	148555.9355	242.2322
2011	1	206	148600.9355	243.48841
2011	1	207	148672.5484	245.50347
2011	1	208	148703.1935	246.37178
2011	1	209	148749.5484	247.69213
2011	1	210	148806.2581	249.31879
2011	1	211	148832.0645	250.06318
2011	1	212	148897.5161	251.96292
2011	1	213	148925	252.76571
2011	1	214	148945.3226	253.36125
2011	1	215	148980.8065	254.40503
2011	1	216	149023.7419	255.67478
2011	1	217	149057.9677	256.69227
2011	1	218	149080.6129	257.3681
2011	1	219	149098.7419	257.91065
2011	1	220	149107.5484	258.17468
2011	1	221	149119.5161	258.534
2011	1	222	149128.0968	258.79199
2011	1	223	149153.2581	259.55024
2011	1	224	149166.5484	259.9518
2011	1	225	149193.8065	260.77766
2011	1	226	149240.871	262.21085
2011	1	227	149251.0645	262.52247
2011	1	228	149261.3871	262.83848
2011	1	229	149277.3226	263.32719
2011	1	230	149358.4516	265.83174
2011	1	231	149370.3548	266.20154
2011	1	232	149380.8065	266.52674
2011	1	233	149384.0645	266.6282
2011	1	234	149384.5806	266.64428
2011	1	235	149385.129	266.66137
2011	1	236	149392.2581	266.88358
2011	1	237	149398.5484	267.07983
2011	1	238	149410.0968	267.44055
2011	1	239	149424.6774	267.89681
2011	1	240	149432.871	268.1536
2011	1	241	149456.7419	268.90336
2011	1	242	149466.0323	269.19582
2011	1	243	149477.8065	269.567
2011	1	244	149484.2258	269.76962
2011	1	245	149487.1935	269.86336
2011	1	246	149506.5806	270.47662
2011	1	247	149509.4516	270.56757
2011	1	248	149523.1935	271.00341
2011	1	249	149529.2258	271.19499
2011	1	250	149537	271.44212
2011	1	251	149542.7097	271.62379
2011	1	252	149542.9032	271.62995
2011	1	253	149603.7097	273.57351
2011	1	254	149634.9677	274.57889
2011	1	255	149658.129	275.32661

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	256	149708.6774	276.96668
2011	1	257	149725.0323	277.49975
2011	1	258	149727.4839	277.57975
2011	1	259	149736.1613	277.86316
2011	1	260	149750.5161	278.33272
2011	1	261	149790.5484	279.64708
2011	1	262	149825.5161	280.80104
2011	1	263	149841.7097	281.3373
2011	1	264	149897.0645	283.17935
2011	1	265	149911.871	283.67443
2011	1	266	149914.5161	283.76298
2011	1	267	149927.6774	284.20404
2011	1	268	150031.8387	287.72272
2011	1	269	150043.7419	288.12801
2011	1	270	150055.5806	288.53175
2011	1	271	150084.6452	289.52572
2011	1	272	150179.1613	292.78537
2011	1	273	150248.871	295.21651
2011	1	274	150278.8065	296.26761
2011	1	275	150306.3871	297.23983
2011	1	276	150325.3871	297.91171
2011	1	277	150332.9677	298.18026
2011	1	278	150366.3548	299.36633
2011	1	279	150378.3226	299.7928
2011	1	280	150453.5484	302.4894
2011	1	281	150536.1935	305.48397
2011	1	282	150599.0968	307.78588
2011	1	283	150658	309.95936
2011	1	284	150671.3226	310.45337
2011	1	285	150698.7097	311.47172
2011	1	286	150717.0968	312.15755
2011	1	287	150734.2258	312.79801
2011	1	288	150752	313.46416
2011	1	289	150790.3548	314.90716
2011	1	290	150840.6452	316.81064
2011	1	291	150970.9677	321.80438
2011	1	292	151006.0968	323.16569
2011	1	293	151048.0323	324.79931
2011	1	294	151067.3548	325.55517
2011	1	295	151075.0645	325.85732
2011	1	296	151081.9677	326.12812
2011	1	297	151157.6452	329.11362
2011	1	298	151163.4516	329.34396
2011	1	299	151175.7097	329.83083
2011	1	300	151182.4194	330.09767
2011	1	301	151189	330.35962
2011	1	302	151197.0645	330.68095
2011	1	303	151248.5161	332.73938
2011	1	304	151262.2581	333.2916
2011	1	305	151285.9355	334.2455
2011	1	306	151303.0968	334.9388

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	307	151335.7097	336.26081
2011	1	308	151351.0645	336.88528
2011	1	309	151392.7097	338.58553
2011	1	310	151431.2581	340.16795
2011	1	311	151450.3226	340.95363
2011	1	312	151485.8065	342.42142
2011	1	313	151519.3226	343.81434
2011	1	314	151578.3548	346.2832
2011	1	315	151616.7419	347.8993
2011	1	316	151625.1613	348.25489
2011	1	317	151633.1613	348.59314
2011	1	318	151648.7742	349.25435
2011	1	319	151680.3548	350.59608
2011	1	320	151744.6129	353.34402
2011	1	321	151770.1613	354.44326
2011	1	322	151808.2903	356.09093
2011	1	323	151846.6774	357.7584
2011	1	324	151889.2258	359.61685
2011	1	325	151945.871	362.10778
2011	1	326	151980.7097	363.64934
2011	1	327	152012.3871	365.05739
2011	1	328	152040.3548	366.3056
2011	1	329	152068.1613	367.55132
2011	1	330	152092.6129	368.65065
2011	1	331	152106.7097	369.2861
2011	1	332	152159.4516	371.67442
2011	1	333	152178	372.51843
2011	1	334	152196.0968	373.34395
2011	1	335	152206.871	373.8364
2011	1	336	152216.5484	374.27934
2011	1	337	152227.9032	374.7998
2011	1	338	152267.9677	376.64262
2011	1	339	152305.3871	378.37288
2011	1	340	152344.8387	380.20667
2011	1	341	152394.6774	382.5374
2011	1	342	152432.6129	384.32209
2011	1	343	152469.3226	386.05791
2011	1	344	152621.129	393.32887
2011	1	345	152654.8387	394.96392
2011	1	346	152676.8065	396.03349
2011	1	347	152700.7742	397.20408
2011	1	348	152723.2903	398.30726
2011	1	349	152749.9677	399.61871
2011	1	350	152780.7742	401.13907
2011	1	351	152796.4839	401.91684
2011	1	352	152817.3548	402.9527
2011	1	353	152896.2581	406.89551
2011	1	354	152915.9677	407.88704
2011	1	355	152940.1613	409.10777
2011	1	356	152980.4194	411.148
2011	1	357	152988.5484	411.56132

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	358	152993.7097	411.82399
2011	1	359	153010.7097	412.69046
2011	1	360	153018.4194	413.08407
2011	1	361	153040.4839	414.21285
2011	1	362	153127.0323	418.67335
2011	1	363	153149.9032	419.86087
2011	1	364	153156.0645	420.18141
2011	1	365	153169.1935	420.86535
2011	1	366	153183.0968	421.59095
2011	1	367	153201.9032	422.57464
2011	1	368	153211.5806	423.0818
2011	1	369	153245.8387	424.88255
2011	1	370	153252.7097	425.24473
2011	1	371	153266.4839	425.97181
2011	1	372	153272.2581	426.27701
2011	1	373	153282.4839	426.81809
2011	1	374	153428.9355	434.65052
2011	1	375	153462.4194	436.46332
2011	1	376	153478.8065	437.35352
2011	1	377	153500.0968	438.51305
2011	1	378	153525.6129	439.90716
2011	1	379	153565.6129	442.10239
2011	1	380	153590.8065	443.49118
2011	1	381	153611.4516	444.63279
2011	1	382	153637.2581	446.06432
2011	1	383	153658.8065	447.26351
2011	1	384	153677.5806	448.31118
2011	1	385	153689.7742	448.99306
2011	1	386	153709.7097	450.11033
2011	1	387	153848.2258	457.95758
2011	1	388	153860.4839	458.65918
2011	1	389	153878.1613	459.67302
2011	1	390	153901.4194	461.01064
2011	1	391	153924.7742	462.3581
2011	1	392	153939.129	463.18843
2011	1	393	153950.4516	463.84451
2011	1	394	153968.5484	464.89522
2011	1	395	153980.9677	465.61779
2011	1	396	154003.0968	466.90831
2011	1	397	154032.9677	468.65651
2011	1	398	154048.0645	469.54275
2011	1	399	154068.5806	470.75006
2011	1	400	154093.5484	472.22388
2011	1	401	154127.871	474.2581
2011	1	402	154170.6774	476.80849
2011	1	403	154181.7419	477.47013
2011	1	404	154197.9355	478.44027
2011	1	405	154210.8387	479.21483
2011	1	406	154230.4194	480.39281
2011	1	407	154240.9032	481.02482
2011	1	408	154286.6774	483.79487

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	409	154298.1935	484.49449
2011	1	410	154320.6452	485.86162
2011	1	411	154350.6774	487.69689
2011	1	412	154368.3226	488.77869
2011	1	413	154378.7097	489.41673
2011	1	414	154413.9355	491.58722
2011	1	415	154442.6129	493.36193
2011	1	416	154447.9355	493.69208
2011	1	417	154458.6452	494.35711
2011	1	418	154465.8065	494.80234
2011	1	419	154480.871	495.74034
2011	1	420	154487.3226	496.14265
2011	1	421	154497.0968	496.75281
2011	1	422	154504.0645	497.18827
2011	1	423	154547.4516	499.90915
2011	1	424	154556.4194	500.47354
2011	1	425	154604.4839	503.51026
2011	1	426	154616.4194	504.26743
2011	1	427	154619.9677	504.49278
2011	1	428	154805.3548	516.41851
2011	1	429	154814.5161	517.01568
2011	1	430	154835.7419	518.40214
2011	1	431	154844.0968	518.94897
2011	1	432	154869.3548	520.60591
2011	1	433	154898.1935	522.50473
2011	1	434	154909.5484	523.25441
2011	1	435	154918.8387	523.86865
2011	1	436	154924.7419	524.25935
2011	1	437	154937.6129	525.11229
2011	1	438	154970.7097	527.31245
2011	1	439	154982.0323	528.06741
2011	1	440	154983.0645	528.1363
2011	1	441	154994.871	528.92487
2011	1	442	155003	529.46856
2011	1	443	155035.9355	531.67754
2011	1	444	155041.3548	532.04197
2011	1	445	155068.871	533.89644
2011	1	446	155087.3226	535.1439
2011	1	447	155094.9355	535.6595
2011	1	448	155094.9355	535.6595
2011	1	449	155098	535.8672
2011	1	450	155107.8387	536.53462
2011	1	451	155107.871	536.53681
2011	1	452	155108.8387	536.6025
2011	1	453	155111.5484	536.7865
2011	1	454	155111.5484	536.7865
2011	1	455	155142.0645	538.86333
2011	1	456	155142.0645	538.86333
2011	1	457	155143.3226	538.94913
2011	1	458	155143.7419	538.97774
2011	1	459	155143.7419	538.97774

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	460	155144.1613	539.00635
2011	1	461	155144.1613	539.00635
2011	1	462	155144.6129	539.03715
2011	1	463	155145.0323	539.06576
2011	1	464	155145.0323	539.06576
2011	1	465	155145.4516	539.09438
2011	1	466	155145.4516	539.09438
2011	1	467	155225.3871	544.57811
2011	1	468	155225.4194	544.58034
2011	1	469	155225.4194	544.58034
2011	1	470	155243.4194	545.82343
2011	1	471	155243.4194	545.82343
2011	1	472	155243.4194	545.82343
2011	1	473	155243.4194	545.82343
2011	1	474	155243.4194	545.82343
2011	1	475	155243.4194	545.82343
2011	1	476	155248.8387	546.19829
2011	1	477	155254.2903	546.57567
2011	1	478	155293.0645	549.26779
2011	1	479	155298.4194	549.64069
2011	1	480	155352.1935	553.4006
2011	1	481	155352.2258	553.40287
2011	1	482	155352.2258	553.40287
2011	1	483	155357.5806	553.77879
2011	1	484	155357.5806	553.77879
2011	1	485	155357.5806	553.77879
2011	1	486	155400.6129	556.80973
2011	1	487	155400.6129	556.80973
2011	1	488	155400.6129	556.80973
2011	1	489	155400.6129	556.80973
2011	1	490	155419.1935	558.12393
2011	1	491	155434.2903	559.19417
2011	1	492	155434.2903	559.19417
2011	1	493	155454.3871	560.62229
2011	1	494	155486.0645	562.8813
2011	1	495	155491.0968	563.24106
2011	1	496	155516.1935	565.03894
2011	1	497	155516.1935	565.03894
2011	1	498	155516.1935	565.03894
2011	1	499	155548.3548	567.35191
2011	1	500	155548.3548	567.35191
2011	1	501	155559.1613	568.13135
2011	1	502	155584.1613	569.93896
2011	1	503	155645.2258	574.38011
2011	1	504	155655.9032	575.16047
2011	1	505	155677.3871	576.73405
2011	1	506	155677.3871	576.73405
2011	1	507	155682.4516	577.10567
2011	1	508	155682.4516	577.10567
2011	1	509	155682.4516	577.10567
2011	1	510	155698.1935	578.26241

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	511	155698.1935	578.26241
2011	1	512	155698.871	578.31224
2011	1	513	155712.8065	579.3384
2011	1	514	155713.4839	579.38833
2011	1	515	155715.5484	579.54053
2011	1	516	155719.9355	579.86411
2011	1	517	155725.7742	580.29505
2011	1	518	155731.9677	580.75255
2011	1	519	155740.0968	581.35361
2011	1	520	155743.5484	581.60902
2011	1	521	155745.6129	581.76185
2011	1	522	155749.2258	582.0294
2011	1	523	155756.2258	582.54815
2011	1	524	155769.4194	583.52724
2011	1	525	155808.4194	586.43172
2011	1	526	155821.0323	587.37436
2011	1	527	155831.5484	588.16153
2011	1	528	155841.7742	588.92804
2011	1	529	155848.6774	589.44611
2011	1	530	155855.2581	589.94041
2011	1	531	155864.1613	590.60989
2011	1	532	155874.3871	591.37982
2011	1	533	155884.8387	592.16785
2011	1	534	155894.9355	592.9302
2011	1	535	155904.0323	593.61794
2011	1	536	155911.3548	594.17217
2011	1	537	155916.129	594.53381
2011	1	538	155918.129	594.68538
2011	1	539	155922.5484	595.02045
2011	1	540	155929.3548	595.53689
2011	1	541	155932.2903	595.75977
2011	1	542	155937.0323	596.11999
2011	1	543	155939.4516	596.30387
2011	1	544	155941.871	596.48781
2011	1	545	155944.4839	596.68653
2011	1	546	155944.4839	596.68653
2011	1	547	155944.4839	596.68653
2011	1	548	155948.871	597.02034
2011	1	549	155956.2903	597.58534
2011	1	550	155956.2903	597.58534
2011	1	551	155956.2903	597.58534
2011	1	552	155956.2903	597.58534
2011	1	553	155960.3548	597.89509
2011	1	554	155966.0968	598.33298
2011	1	555	155966.7742	598.38467
2011	1	556	155970.4839	598.66778
2011	1	557	155970.4839	598.66778
2011	1	558	155973.4839	598.89684
2011	1	559	155977.1935	599.18021
2011	1	560	155981.5484	599.51305
2011	1	561	155986.9677	599.92752

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	562	156007	601.46224
2011	1	563	156024.6129	602.81507
2011	1	564	156024.6129	602.81507
2011	1	565	156030.0323	603.23198
2011	1	566	156030.0323	603.23198
2011	1	567	156035.4516	603.6492
2011	1	568	156037.7742	603.8281
2011	1	569	156047.5806	604.58408
2011	1	570	156049.9032	604.76328
2011	1	571	156052.2258	604.94253
2011	1	572	156059.1935	605.48063
2011	1	573	156064.6129	605.89951
2011	1	574	156068.3226	606.18642
2011	1	575	156070.6452	606.36612
2011	1	576	156084.0968	607.40802
2011	1	577	156094.9032	608.24642
2011	1	578	156101	608.71997
2011	1	579	156125	610.58793
2011	1	580	156125.6774	610.64075
2011	1	581	156125.6774	610.64075
2011	1	582	156136.8065	611.50909
2011	1	583	156156.6129	613.05775
2011	1	584	156164.0323	613.63895
2011	1	585	156188	615.52046
2011	1	586	156188	615.52046
2011	1	587	156194.0323	615.99498
2011	1	588	156196.3548	616.17778
2011	1	589	156221.129	618.13129
2011	1	590	156225.6452	618.48811
2011	1	591	156244.0645	619.94569
2011	1	592	156262.3548	621.39668
2011	1	593	156266.871	621.75551
2011	1	594	156282.7419	623.01828
2011	1	595	156282.7419	623.01828
2011	1	596	156285.0645	623.2033
2011	1	597	156289.9032	623.58896
2011	1	598	156296.7097	624.13187
2011	1	599	156325.5161	626.4352
2011	1	600	156340.8387	627.66406
2011	1	601	156346.2581	628.0993
2011	1	602	156363	629.44592
2011	1	603	156376.9355	630.56914
2011	1	604	156391.4194	631.73883
2011	1	605	156402.5484	632.63915
2011	1	606	156408.9355	633.15647
2011	1	607	156410.4194	633.27672
2011	1	608	156414.871	633.63762
2011	1	609	156417.1935	633.826
2011	1	610	156419.5161	634.01444
2011	1	611	156425.9032	634.53296
2011	1	612	156472.9032	638.36242

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	613	156496.129	640.26388
2011	1	614	156509.129	641.33079
2011	1	615	156527.6774	642.85633
2011	1	616	156529.1613	642.97854
2011	1	617	156529.1613	642.97854
2011	1	618	156529.1613	642.97854
2011	1	619	156534	643.37722
2011	1	620	156535.4839	643.49953
2011	1	621	156544.0323	644.20465
2011	1	622	156544.0323	644.20465
2011	1	623	156544.0323	644.20465
2011	1	624	156544.0323	644.20465
2011	1	625	156564.9355	645.93233
2011	1	626	156569.4516	646.30624
2011	1	627	156580.0968	647.18851
2011	1	628	156580.0968	647.18851
2011	1	629	156580.0968	647.18851
2011	1	630	156602.3548	649.03739
2011	1	631	156602.3548	649.03739
2011	1	632	156602.3548	649.03739
2011	1	633	156607.6129	649.47497
2011	1	634	156607.6129	649.47497
2011	1	635	156613.6774	649.98006
2011	1	636	156621.9032	650.66581
2011	1	637	156621.9032	650.66581
2011	1	638	156626.4194	651.04263
2011	1	639	156630.9355	651.41969
2011	1	640	156657.9677	653.68146
2011	1	641	156657.9677	653.68146
2011	1	642	156659.4516	653.80586
2011	1	643	156659.4516	653.80586
2011	1	644	156659.4516	653.80586
2011	1	645	156659.4516	653.80586
2011	1	646	156659.4516	653.80586
2011	1	647	156659.4516	653.80586
2011	1	648	156659.4516	653.80586
2011	1	649	156660.9355	653.93028
2011	1	650	156662.4194	654.05472
2011	1	651	156732.0323	659.9212
2011	1	652	156734	660.08783
2011	1	653	156735.5484	660.21899
2011	1	654	156737.0323	660.34471
2011	1	655	156743.2258	660.86971
2011	1	656	156743.2258	660.86971
2011	1	657	156743.2258	660.86971
2011	1	658	156743.2258	660.86971
2011	1	659	156743.2258	660.86971
2011	1	660	156743.2258	660.86971
2011	1	661	156743.2258	660.86971
2011	1	662	156743.2258	660.86971
2011	1	663	156744.2903	660.95999

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	664	156744.6452	660.99008
2011	1	665	156745	661.02018
2011	1	666	156745	661.02018
2011	1	667	156745.3548	661.05028
2011	1	668	156747.2903	661.21448
2011	1	669	156752.0323	661.61696
2011	1	670	156752.3871	661.64709
2011	1	671	156752.7419	661.67721
2011	1	672	156752.7419	661.67721
2011	1	673	156754.3226	661.81144
2011	1	674	156760.6452	662.34865
2011	1	675	156760.6452	662.34865
2011	1	676	156761	662.37881
2011	1	677	156761	662.37881
2011	1	678	156761	662.37881
2011	1	679	156761	662.37881
2011	1	680	156761	662.37881
2011	1	681	156762.9355	662.54337
2011	1	682	156767.3548	662.91925
2011	1	683	156769.2903	663.08395
2011	1	684	156769.2903	663.08395
2011	1	685	156769.2903	663.08395
2011	1	686	156769.2903	663.08395
2011	1	687	156769.6452	663.11415
2011	1	688	156769.6452	663.11415
2011	1	689	156770	663.14435
2011	1	690	156770	663.14435
2011	1	691	156776.3226	663.6827
2011	1	692	156776.3226	663.6827
2011	1	693	156776.3226	663.6827
2011	1	694	156776.3226	663.6827
2011	1	695	156776.3226	663.6827
2011	1	696	156776.3226	663.6827
2011	1	697	156777.9032	663.81736
2011	1	698	156778.2581	663.8476
2011	1	699	156850.2581	670.01265
2011	1	700	156855.0968	670.42914
2011	1	701	156855.0968	670.42914
2011	1	702	156855.0968	670.42914
2011	1	703	156856.6774	670.56525
2011	1	704	156859.8387	670.83757
2011	1	705	156859.8387	670.83757
2011	1	706	156859.8387	670.83757
2011	1	707	156863	671.10999
2011	1	708	156863	671.10999
2011	1	709	156863	671.10999
2011	1	710	156863.7097	671.17117
2011	1	711	156866.3548	671.39923
2011	1	712	156866.3548	671.39923
2011	1	713	156866.3548	671.39923
2011	1	714	156866.3548	671.39923

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	715	156871.0968	671.80828
2011	1	716	156871.0968	671.80828
2011	1	717	156872.6774	671.94469
2011	1	718	156872.6774	671.94469
2011	1	719	156872.6774	671.94469
2011	1	720	156874.2581	672.08113
2011	1	721	156875.8387	672.2176
2011	1	722	156877.4194	672.3541
2011	1	723	156877.4194	672.3541
2011	1	724	156877.4194	672.3541
2011	1	725	156879	672.49062
2011	1	726	156879	672.49062
2011	1	727	156879	672.49062
2011	1	728	156879	672.49062
2011	1	729	156879	672.49062
2011	1	730	156879	672.49062
2011	1	731	156879	672.49062
2011	1	732	156879	672.49062
2011	1	733	156879	672.49062
2011	1	734	156879	672.49062
2011	1	735	156879	672.49062
2011	1	736	156879	672.49062
2011	1	737	156879	672.49062
2011	1	738	156879	672.49062
2011	1	739	156879	672.49062
2011	1	740	156879	672.49062
2011	1	741	156879	672.49062
2011	1	742	156939	677.69483
2011	1	743	156939	677.69483
2011	1	744	156939	677.69483
2011	1	745	156939	677.69483
2011	1	746	156939	677.69483
2011	1	747	156939	677.69483
2011	1	748	156939	677.69483
2011	1	749	156939	677.69483
2011	1	750	156939	677.69483
2011	1	751	156939	677.69483
2011	1	752	156939	677.69483
2011	1	753	156939	677.69483
2011	1	754	156939	677.69483
2011	1	755	156939	677.69483
2011	1	756	156939	677.69483
2011	1	757	157011	683.99623
2011	1	758	157011	683.99623
2011	1	759	157011	683.99623
2011	1	760	157011	683.99623
2011	1	761	157011	683.99623
2011	1	762	157011	683.99623
2011	1	763	157011	683.99623
2011	1	764	157011	683.99623
2011	1	765	157914.7097	768.5706

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	766	157914.7097	768.5706
2011	1	767	157914.7097	768.5706
2011	1	768	157914.7097	768.5706
2011	1	769	157914.7097	768.5706
2011	1	770	157914.7097	768.5706
2011	1	771	157914.7097	768.5706
2011	1	772	157914.7097	768.5706
2011	1	773	157914.7097	768.5706
2011	1	774	157914.7097	768.5706
2011	1	775	157914.7097	768.5706
2011	1	776	157914.7097	768.5706
2011	1	777	157914.7097	768.5706
2011	1	778	157914.7097	768.5706
2011	1	779	157914.7097	768.5706
2011	1	780	157914.7097	768.5706
2011	1	781	157914.7097	768.5706
2011	1	782	157914.7097	768.5706
2011	1	783	157914.7097	768.5706
2011	1	784	157914.7097	768.5706
2011	1	785	157914.7097	768.5706
2011	1	786	157914.7097	768.5706
2011	1	787	157914.7097	768.5706
2011	1	788	157914.7097	768.5706
2011	1	789	157914.7097	768.5706
2011	1	790	157914.7097	768.5706
2011	1	791	157914.7097	768.5706
2011	1	792	157914.7097	768.5706
2011	1	793	157944.7097	771.56045
2011	1	794	157944.7097	771.56045
2011	1	795	157944.7097	771.56045
2011	1	796	157944.7097	771.56045
2011	1	797	157944.7097	771.56045
2011	1	798	157944.7097	771.56045
2011	1	799	157944.7097	771.56045
2011	1	800	157944.7097	771.56045
2011	1	801	157944.7097	771.56045
2011	1	802	157944.7097	771.56045
2011	1	803	157944.7097	771.56045
2011	1	804	157944.7097	771.56045
2011	1	805	157944.7097	771.56045
2011	1	806	157944.7097	771.56045
2011	1	807	157944.7097	771.56045
2011	1	808	157944.7097	771.56045
2011	1	809	157944.7097	771.56045
2011	1	810	157944.7097	771.56045
2011	1	811	157944.7097	771.56045
2011	1	812	157944.7097	771.56045
2011	1	813	157944.7097	771.56045
2011	1	814	157944.7097	771.56045
2011	1	815	157944.7097	771.56045
2011	1	816	157980.7097	775.16442

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	817	157980.7097	775.16442
2011	1	818	157980.7097	775.16442
2011	1	819	157980.7097	775.16442
2011	1	820	157980.7097	775.16442
2011	1	821	157980.7097	775.16442
2011	1	822	157980.7097	775.16442
2011	1	823	157980.7097	775.16442
2011	1	824	157980.7097	775.16442
2011	1	825	157980.7097	775.16442
2011	1	826	157980.7097	775.16442
2011	1	827	157980.7097	775.16442
2011	1	828	157980.7097	775.16442
2011	1	829	157980.7097	775.16442
2011	1	830	157980.7097	775.16442
2011	1	831	157980.7097	775.16442
2011	1	832	157980.7097	775.16442
2011	1	833	157980.7097	775.16442
2011	1	834	157980.7097	775.16442
2011	1	835	157980.8387	775.17737
2011	1	836	157981.0968	775.20327
2011	1	837	157981.2258	775.21622
2011	1	838	157981.2258	775.21622
2011	1	839	157981.2258	775.21622
2011	1	840	157981.2258	775.21622
2011	1	841	157981.3548	775.22917
2011	1	842	157981.3548	775.22917
2011	1	843	157981.4839	775.24212
2011	1	844	157981.4839	775.24212
2011	1	845	157981.4839	775.24212
2011	1	846	157981.871	775.28098
2011	1	847	157982.6452	775.35869
2011	1	848	157982.6452	775.35869
2011	1	849	157982.6452	775.35869
2011	1	850	157982.6452	775.35869
2011	1	851	157982.7742	775.37164
2011	1	852	157982.7742	775.37164
2011	1	853	157982.7742	775.37164
2011	1	854	157982.7742	775.37164
2011	1	855	157982.7742	775.37164
2011	1	856	157982.7742	775.37164
2011	1	857	157982.7742	775.37164
2011	1	858	157982.7742	775.37164
2011	1	859	157983.1613	775.4105
2011	1	860	157983.1613	775.4105
2011	1	861	157983.1613	775.4105
2011	1	862	157983.1613	775.4105
2011	1	863	157983.1613	775.4105
2011	1	864	157983.1613	775.4105
2011	1	865	157983.1613	775.4105
2011	1	866	157983.1613	775.4105
2011	1	867	157983.1613	775.4105

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	868	157983.1613	775.4105
2011	1	869	157983.1613	775.4105
2011	1	870	157983.1613	775.4105
2011	1	871	157983.1613	775.4105
2011	1	872	157983.1613	775.4105
2011	1	873	157983.1613	775.4105
2011	1	874	158019.1613	779.03338
2011	1	875	158019.1613	779.03338
2011	1	876	158019.1613	779.03338
2011	1	877	158019.6774	779.08545
2011	1	878	158019.6774	779.08545
2011	1	879	158019.6774	779.08545
2011	1	880	158019.6774	779.08545
2011	1	881	158019.6774	779.08545
2011	1	882	158019.6774	779.08545
2011	1	883	158019.6774	779.08545
2011	1	884	158019.6774	779.08545
2011	1	885	158019.8065	779.09847
2011	1	886	158020.3226	779.15054
2011	1	887	158020.3226	779.15054
2011	1	888	158020.4516	779.16356
2011	1	889	158020.4516	779.16356
2011	1	890	158020.4516	779.16356
2011	1	891	158020.7097	779.1896
2011	1	892	158020.7097	779.1896
2011	1	893	158020.7097	779.1896
2011	1	894	158022.2581	779.34586
2011	1	895	158026.9032	779.81482
2011	1	896	158026.9032	779.81482
2011	1	897	158028.4516	779.9712
2011	1	898	158034.6452	780.59708
2011	1	899	158034.6452	780.59708
2011	1	900	158034.6452	780.59708
2011	1	901	158034.6452	780.59708
2011	1	902	158040.9032	781.23
2011	1	903	158051.9355	782.3471
2011	1	904	158051.9355	782.3471
2011	1	905	158055.0968	782.66751
2011	1	906	158067.7419	783.95054
2011	1	907	158067.7419	783.95054
2011	1	908	158073.9355	784.57977
2011	1	909	158073.9355	784.57977
2011	1	910	158077.0968	784.90115
2011	1	911	158080.2581	785.22266
2011	1	912	158084.9677	785.7019
2011	1	913	158084.9677	785.7019
2011	1	914	158084.9677	785.7019
2011	1	915	158084.9677	785.7019
2011	1	916	158102.2581	787.46395
2011	1	917	158102.2581	787.46395
2011	1	918	158105.3548	787.77998

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	919	158105.3548	787.77998
2011	1	920	158108.5161	788.10273
2011	1	921	158110.0645	788.26087
2011	1	922	158110.0645	788.26087
2011	1	923	158114.7097	788.73546
2011	1	924	158117.871	789.05862
2011	1	925	158125.7419	789.86384
2011	1	926	158133.6129	790.66991
2011	1	927	158135.1613	790.82858
2011	1	928	158136.7097	790.98729
2011	1	929	158139.871	791.31142
2011	1	930	158141.4194	791.47023
2011	1	931	158141.4194	791.47023
2011	1	932	158186.9032	796.1502
2011	1	933	158190.0645	796.47655
2011	1	934	158193.2258	796.80304
2011	1	935	158201.3226	797.63991
2011	1	936	158211.0645	798.64803
2011	1	937	158211.0645	798.64803
2011	1	938	158215.871	799.14591
2011	1	939	158217.5161	799.3164
2011	1	940	158219.1613	799.48693
2011	1	941	158225.7419	800.16942
2011	1	942	158226.2903	800.22632
2011	1	943	158232.871	800.90948
2011	1	944	158234.5161	801.08036
2011	1	945	158234.5161	801.08036
2011	1	946	158236.7097	801.30827
2011	1	947	158242.1935	801.87833
2011	1	948	158245.4839	802.22057
2011	1	949	158247.129	802.39175
2011	1	950	158247.129	802.39175
2011	1	951	158247.6774	802.44882
2011	1	952	158248.7742	802.56297
2011	1	953	158248.7742	802.56297
2011	1	954	158255.3548	803.24821
2011	1	955	158255.3548	803.24821
2011	1	956	158261.9355	803.93408
2011	1	957	158264.129	804.16284
2011	1	958	158265.7742	804.33445
2011	1	959	158265.7742	804.33445
2011	1	960	158267.4194	804.5061
2011	1	961	158267.9677	804.56333
2011	1	962	158277.1613	805.52333
2011	1	963	158289.6452	806.82885
2011	1	964	158291.3226	807.00443
2011	1	965	158298.4516	807.75113
2011	1	966	158304.2581	808.35983
2011	1	967	158308.6774	808.82344
2011	1	968	158308.6774	808.82344
2011	1	969	158321.4839	810.16847

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	1	970	158328.6129	810.91824
2011	1	971	158334.0968	811.49547
2011	1	972	158341.9355	812.32133
2011	1	973	158345.2258	812.66825
2011	1	974	158349.8065	813.15147
2011	1	975	158359.5161	814.17677
2011	1	976	158368.6774	815.1454
2011	1	977	158372.5161	815.55163
2011	1	978	158373.0645	815.60968
2011	1	979	158375.2581	815.84192
2011	1	980	158376.0968	815.93074
2011	1	981	158382.0645	816.563
2011	1	982	158382.0645	816.563
2011	1	983	158392.129	817.63046
2011	1	984	158398.8387	818.34292
2011	1	985	158398.8387	818.34292
2011	1	986	158400.5161	818.52114
2011	1	987	158403.0323	818.78854
2011	1	988	158404.7097	818.96685
2011	1	989	158404.7097	818.96685
2011	1	990	158404.7097	818.96685
2011	1	991	158443.6452	823.11733
2011	1	992	158445.3226	823.29664
2011	1	993	158453.7097	824.19378
2011	1	994	158458.7419	824.73256
2011	1	995	158462.5161	825.13688
2011	1	996	158462.5161	825.13688
2011	1	997	158465.871	825.49646
2011	1	998	158516.2581	830.91679
2011	1	999	158517.2258	831.02126

February 2011

Net Benefit Tab

Effective_month	Test_result
2/1/2011 0:00	\$40.49

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.841855405	1.325128257

Curve Parameters Tab

a	b	c	d
2.237450411	0.000160854	16.81927066	37.71088706

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	1	20059.78571	37.71091
2011	2	2	20188.21429	37.71091
2011	2	3	20188.39286	37.71091
2011	2	4	21426.89286	37.71091
2011	2	5	25047.10714	37.71092
2011	2	6	29703.42857	37.71095
2011	2	7	31714.17857	37.71097
2011	2	8	31894.5	37.71097
2011	2	9	32676.92857	37.71098
2011	2	10	32684	37.71098
2011	2	11	32690.5	37.71098
2011	2	12	32729.07143	37.71098
2011	2	13	33062.64286	37.71099
2011	2	14	33128.39286	37.71099
2011	2	15	35544	37.71102
2011	2	16	35678.60714	37.71102
2011	2	17	35678.67857	37.71102
2011	2	18	35794.14286	37.71103
2011	2	19	35835.67857	37.71103
2011	2	20	36344.21429	37.71104
2011	2	21	36739.92857	37.71104
2011	2	22	38682.25	37.71109
2011	2	23	41045.42857	37.71116
2011	2	24	42695.78571	37.71122
2011	2	25	45057.03571	37.71134
2011	2	26	48172.10714	37.71157
2011	2	27	51643.60714	37.71195
2011	2	28	56696.89286	37.71293
2011	2	29	63250.5	37.71567
2011	2	30	68972.89286	37.72092
2011	2	31	72814.5	37.72739
2011	2	32	76954.17857	37.73912
2011	2	33	80723.64286	37.75691
2011	2	34	84243.71429	37.78353
2011	2	35	87062.28571	37.81558
2011	2	36	89033.25	37.84606
2011	2	37	90921.25	37.88356
2011	2	38	92129.57143	37.91284
2011	2	39	93114.21429	37.94034
2011	2	40	94093.75	37.97142
2011	2	41	95061.64286	38.00625
2011	2	42	95689.82143	38.03131
2011	2	43	96665.21429	38.07451
2011	2	44	97997.57143	38.14308
2011	2	45	98867.46429	38.19468
2011	2	46	99884.03571	38.26284
2011	2	47	100913.5357	38.34166
2011	2	48	102139.7143	38.45036
2011	2	49	102973.2857	38.53476
2011	2	50	103712.7143	38.61766
2011	2	51	104750.4643	38.74826

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	52	105548.0714	38.86128
2011	2	53	106588.75	39.02747
2011	2	54	107586.25	39.20925
2011	2	55	108316.8929	39.35814
2011	2	56	108825.7857	39.4705
2011	2	57	109496.0714	39.63026
2011	2	58	109893.6071	39.73179
2011	2	59	110673.1786	39.94674
2011	2	60	111164.5357	40.09382
2011	2	61	111658.6071	40.25147
2011	2	62	112376.3929	40.49926
2011	2	63	112994.4286	40.73191
2011	2	64	113532.8571	40.95035
2011	2	65	115832.4286	42.07566
2011	2	66	116415.9643	42.41872
2011	2	67	117068.9286	42.83465
2011	2	68	117944.1429	43.45037
2011	2	69	118550.1429	43.91953
2011	2	70	118939.3214	44.24087
2011	2	71	119446.1071	44.68436
2011	2	72	119813.0357	45.02414
2011	2	73	120262.1429	45.46264
2011	2	74	121022.8571	46.26621
2011	2	75	121317.3929	46.59925
2011	2	76	121674.25	47.02017
2011	2	77	122269.4286	47.76702
2011	2	78	122705.25	48.35164
2011	2	79	123143.6071	48.97394
2011	2	80	123634.3929	49.71396
2011	2	81	123896.75	50.12929
2011	2	82	124225.75	50.6705
2011	2	83	124601.3214	51.3172
2011	2	84	124962.6071	51.96974
2011	2	85	125181.4643	52.38016
2011	2	86	125311.9643	52.63048
2011	2	87	125566	53.13009
2011	2	88	125787.6071	53.57956
2011	2	89	125946.1429	53.90912
2011	2	90	126102.1071	54.24002
2011	2	91	126259.3929	54.58057
2011	2	92	126457.5357	55.01959
2011	2	93	126587	55.31259
2011	2	94	126776.6786	55.75084
2011	2	95	126910.5714	56.06676
2011	2	96	127031.25	56.35623
2011	2	97	127157.3571	56.66361
2011	2	98	127205.8214	56.78308
2011	2	99	127370.3214	57.19424
2011	2	100	127481.9643	57.47832
2011	2	101	127640.8214	57.8897
2011	2	102	127691.75	58.02339

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	103	127805.5714	58.32538
2011	2	104	127915.8571	58.62228
2011	2	105	127982.9643	58.80502
2011	2	106	128134.7143	59.22418
2011	2	107	128257.4286	59.56921
2011	2	108	128312.7857	59.72667
2011	2	109	128365.8214	59.87858
2011	2	110	128523.1786	60.33551
2011	2	111	128845.0357	61.29965
2011	2	112	128998.3929	61.77339
2011	2	113	129206.4286	62.43128
2011	2	114	129388.7857	63.02274
2011	2	115	129608.9286	63.75564
2011	2	116	129834.3571	64.52813
2011	2	117	130257.6071	66.04095
2011	2	118	130468.7143	66.82711
2011	2	119	130829.0357	68.21967
2011	2	120	131195	69.70222
2011	2	121	131457.6071	70.81027
2011	2	122	131798.0714	72.30415
2011	2	123	132186.6071	74.0915
2011	2	124	132526.0357	75.72837
2011	2	125	132779.25	76.99726
2011	2	126	133083.2143	78.57652
2011	2	127	133415.6071	80.37625
2011	2	128	133689.6071	81.91925
2011	2	129	134039.7143	83.97232
2011	2	130	134757.3929	88.48376
2011	2	131	134987.4643	90.02118
2011	2	132	135228.3571	91.68082
2011	2	133	135465.1786	93.36373
2011	2	134	135749.9286	95.45686
2011	2	135	136008.5357	97.42596
2011	2	136	136128.6071	98.3629
2011	2	137	136276.2857	99.53544
2011	2	138	136386.2143	100.42296
2011	2	139	136485.9643	101.23931
2011	2	140	136594.9643	102.14352
2011	2	141	136688.6429	102.93091
2011	2	142	136783.8929	103.74138
2011	2	143	136921	104.92571
2011	2	144	137020.0357	105.79437
2011	2	145	137130.4643	106.77621
2011	2	146	137324.6429	108.53715
2011	2	147	137416.1071	109.38209
2011	2	148	137540.9286	110.55147
2011	2	149	137675.3929	111.83255
2011	2	150	137891.9286	113.94306
2011	2	151	138070.3571	115.72725
2011	2	152	138919.5714	124.80829
2011	2	153	139093.25	126.79189

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	154	139193.3929	127.9561
2011	2	155	139447	130.97291
2011	2	156	139579.9643	132.59469
2011	2	157	139672.6071	133.74131
2011	2	158	139896.9286	136.5754
2011	2	159	140013.7143	138.08384
2011	2	160	140207.6786	140.64015
2011	2	161	140303.0714	141.92114
2011	2	162	140467.8929	144.17215
2011	2	163	140585.0357	145.8015
2011	2	164	141036.5	152.3176
2011	2	165	141197.1071	154.72921
2011	2	166	141326.0714	156.70237
2011	2	167	141527.3214	159.84819
2011	2	168	141599.6786	160.99945
2011	2	169	141712.0714	162.80926
2011	2	170	141951.1429	166.74776
2011	2	171	142079.8571	168.91933
2011	2	172	142244.2143	171.74544
2011	2	173	142361.9286	173.80687
2011	2	174	142434.1071	175.08652
2011	2	175	142501.6786	176.29539
2011	2	176	142561.0714	177.36673
2011	2	177	142630.3214	178.62633
2011	2	178	142699.3929	179.894
2011	2	179	142780.6071	181.39912
2011	2	180	142844.3214	182.59107
2011	2	181	142912.3214	183.8741
2011	2	182	142944.4286	184.48385
2011	2	183	142971.8929	185.00744
2011	2	184	143035.25	186.22244
2011	2	185	143066.8214	186.83162
2011	2	186	143149.9643	188.44787
2011	2	187	143202.0357	189.46902
2011	2	188	143238	190.17834
2011	2	189	143284.7857	191.10605
2011	2	190	143408.0357	193.57707
2011	2	191	144088.4643	207.95301
2011	2	192	144162.6786	209.59908
2011	2	193	144234.2143	211.20081
2011	2	194	144273.8571	212.09485
2011	2	195	145018.6071	229.77386
2011	2	196	145082.1429	231.3626
2011	2	197	145119.25	232.29656
2011	2	198	145170.5357	233.5948
2011	2	199	145205.3214	234.48029
2011	2	200	145309.1071	237.14607
2011	2	201	145319.6071	237.41777
2011	2	202	145351.6786	238.24995
2011	2	203	145404.2857	239.6225
2011	2	204	145407.0357	239.69451

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	205	145426.2857	240.19928
2011	2	206	145434.25	240.40849
2011	2	207	145461.1429	241.11651
2011	2	208	145468.8571	241.32006
2011	2	209	145508.6429	242.37311
2011	2	210	145537.25	243.13365
2011	2	211	145580.9286	244.30033
2011	2	212	145625.0357	245.48518
2011	2	213	145670.8214	246.7223
2011	2	214	145714.2857	247.90352
2011	2	215	145754.7143	249.00823
2011	2	216	145773.9286	249.5353
2011	2	217	145867.7857	252.12883
2011	2	218	145877.9286	252.411
2011	2	219	145890.7857	252.76921
2011	2	220	145898.7857	252.9924
2011	2	221	146329	265.34232
2011	2	222	146339.2143	265.64399
2011	2	223	146361.25	266.29616
2011	2	224	146416.1071	267.92782
2011	2	225	146472	269.60227
2011	2	226	146527.1071	271.2651
2011	2	227	146551.3571	272.0006
2011	2	228	146576.5714	272.76781
2011	2	229	146676.6071	275.83649
2011	2	230	146722.9643	277.27209
2011	2	231	146765.8214	278.60699
2011	2	232	146787.4643	279.28394
2011	2	233	146807.6786	279.91793
2011	2	234	146838.2143	280.87878
2011	2	235	146876.9286	282.10247
2011	2	236	146945.6429	284.28959
2011	2	237	146996.6429	285.92553
2011	2	238	147054.3214	287.78877
2011	2	239	147071.2143	288.33712
2011	2	240	147080.2143	288.62976
2011	2	241	147085.7143	288.80876
2011	2	242	147092.1071	289.01698
2011	2	243	147130.3929	290.26759
2011	2	244	147138.3929	290.52969
2011	2	245	147151.0357	290.94447
2011	2	246	147156.8929	291.13686
2011	2	247	147163.3571	291.34936
2011	2	248	147168.6071	291.52207
2011	2	249	147173.1429	291.67138
2011	2	250	147179.1786	291.8702
2011	2	251	147192.8571	292.32137
2011	2	252	147195.6429	292.41335
2011	2	253	147203.25	292.66469
2011	2	254	147205	292.72255
2011	2	255	147209.5357	292.87257

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	256	147213.9643	293.01912
2011	2	257	147215.5	293.06997
2011	2	258	147216.3929	293.09953
2011	2	259	147217.2857	293.1291
2011	2	260	147270.6071	294.90108
2011	2	261	147270.7143	294.90465
2011	2	262	147270.7857	294.90703
2011	2	263	147289.5714	295.53426
2011	2	264	147315.5357	296.40369
2011	2	265	147321.8929	296.61701
2011	2	266	147330.2143	296.8965
2011	2	267	147355.2857	297.74042
2011	2	268	147355.3929	297.74403
2011	2	269	147355.4286	297.74524
2011	2	270	147373.9286	298.36973
2011	2	271	147380.1429	298.57984
2011	2	272	147387.3929	298.82518
2011	2	273	147399.9286	299.24993
2011	2	274	147425.4643	300.11731
2011	2	275	147426.4643	300.15133
2011	2	276	147440.6429	300.63424
2011	2	277	147452.25	301.03023
2011	2	278	147453.8929	301.08633
2011	2	279	147464.3571	301.44392
2011	2	280	147479.0357	301.94633
2011	2	281	147500.5714	302.68519
2011	2	282	147503.7143	302.79319
2011	2	283	147527.0714	303.5972
2011	2	284	147545.1071	304.2197
2011	2	285	147556.8214	304.6248
2011	2	286	147608.8929	306.43298
2011	2	287	147630.2143	307.17689
2011	2	288	147657	308.11438
2011	2	289	147676.5357	308.80018
2011	2	290	147712.2857	310.05968
2011	2	291	147717.1071	310.22999
2011	2	292	147722.8929	310.4345
2011	2	293	147754.0357	311.53797
2011	2	294	147783.5357	312.58735
2011	2	295	147851.2857	315.01262
2011	2	296	147905.2143	316.9584
2011	2	297	147944.2143	318.37405
2011	2	298	147969.1071	319.28138
2011	2	299	148099.6071	324.08624
2011	2	300	148147.5	325.87009
2011	2	301	148182.8214	327.19281
2011	2	302	148228.3214	328.90566
2011	2	303	148316.1071	332.23904
2011	2	304	148325.0714	332.58157
2011	2	305	148341.5	333.21034
2011	2	306	148360.0357	333.92138

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	307	148380.6429	334.71388
2011	2	308	148410.3571	335.86036
2011	2	309	148477.2857	338.45894
2011	2	310	148499.25	339.31665
2011	2	311	148525.5714	340.34773
2011	2	312	148569.3214	342.06935
2011	2	313	148600.8929	343.3178
2011	2	314	148628.2143	344.40232
2011	2	315	148655.5	345.48927
2011	2	316	148660.6786	345.696
2011	2	317	148684.7143	346.65732
2011	2	318	148693.1071	346.9937
2011	2	319	148769.75	350.08251
2011	2	320	148776.6071	350.36036
2011	2	321	148780.2857	350.50951
2011	2	322	148787.75	350.81239
2011	2	323	148796.4643	351.16636
2011	2	324	148805.2857	351.52509
2011	2	325	148900.6786	355.43062
2011	2	326	148919.75	356.21725
2011	2	327	148955.3214	357.68964
2011	2	328	148980.6071	358.74042
2011	2	329	149096.7857	363.6129
2011	2	330	149128.6786	364.96336
2011	2	331	149160.8214	366.33007
2011	2	332	149224	369.03307
2011	2	333	149244.3571	369.90875
2011	2	334	149266.7143	370.87312
2011	2	335	149291.5	371.94553
2011	2	336	149306.0357	372.57605
2011	2	337	149326.8214	373.47975
2011	2	338	149344.3214	374.24249
2011	2	339	149368.1071	375.28196
2011	2	340	149397.0357	376.55052
2011	2	341	149434.7143	378.20993
2011	2	342	149458.5714	379.26483
2011	2	343	149496.8571	380.96455
2011	2	344	149526.8571	382.30233
2011	2	345	149578.25	384.6062
2011	2	346	149611.8571	386.12109
2011	2	347	149638.3571	387.32027
2011	2	348	149658.25	388.22318
2011	2	349	149685.0357	389.44263
2011	2	350	149704.25	390.32
2011	2	351	149785.1429	394.0378
2011	2	352	149792.7143	394.38778
2011	2	353	149812.8571	395.32054
2011	2	354	149837.1071	396.44672
2011	2	355	149928.5714	400.72636
2011	2	356	149968.5357	402.61229
2011	2	357	150002.9286	404.24315

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	358	150029.25	405.49619
2011	2	359	150060.5714	406.99285
2011	2	360	150083.7143	408.10261
2011	2	361	150138.8571	410.76032
2011	2	362	150168.6786	412.20555
2011	2	363	150194.75	413.47364
2011	2	364	150280.3214	417.66599
2011	2	365	150321.9643	419.72306
2011	2	366	150346.1429	420.92254
2011	2	367	150371.25	422.17206
2011	2	368	150396.7857	423.4471
2011	2	369	150413.8571	424.30186
2011	2	370	150482.3571	427.75073
2011	2	371	150523.7143	429.84787
2011	2	372	150564.6071	431.93255
2011	2	373	150594.4286	433.45981
2011	2	374	150645.8214	436.10571
2011	2	375	150660.2143	436.84988
2011	2	376	150673.4643	437.53618
2011	2	377	150739.3929	440.96864
2011	2	378	150753.1429	441.68821
2011	2	379	150777.5714	442.96979
2011	2	380	150786.3571	443.43171
2011	2	381	150791.1429	443.68354
2011	2	382	150818.1786	445.10915
2011	2	383	150834.5357	445.9741
2011	2	384	150846.7143	446.61928
2011	2	385	150851.6786	446.88256
2011	2	386	150860.25	447.33755
2011	2	387	150878.9643	448.33271
2011	2	388	150886.9286	448.75696
2011	2	389	150897.8929	449.34172
2011	2	390	150910.2857	450.00368
2011	2	391	150925.2857	450.80633
2011	2	392	150934.3929	451.29441
2011	2	393	150944.7143	451.84827
2011	2	394	150974.3571	453.44305
2011	2	395	150997.7143	454.70399
2011	2	396	151084.4643	459.42078
2011	2	397	151104.9286	460.54123
2011	2	398	151137.7143	462.34249
2011	2	399	151140	462.46836
2011	2	400	151148.4643	462.93477
2011	2	401	151163.3571	463.75667
2011	2	402	151182.9643	464.84116
2011	2	403	151199.2143	465.74206
2011	2	404	151223.4643	467.09001
2011	2	405	151229.2857	467.41423
2011	2	406	151237.3571	467.86416
2011	2	407	151242.7857	468.16704
2011	2	408	151265.7857	469.45264

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	409	151404.5714	477.2921
2011	2	410	151422.0357	478.28861
2011	2	411	151438.6786	479.24036
2011	2	412	151457.3571	480.31098
2011	2	413	151466.1071	480.8134
2011	2	414	151486.9643	482.01331
2011	2	415	151507.6071	483.2041
2011	2	416	151532.7857	484.66085
2011	2	417	151554.9643	485.94797
2011	2	418	151567.6429	486.68543
2011	2	419	151577.3214	487.24921
2011	2	420	151590.25	488.00341
2011	2	421	151625	490.03685
2011	2	422	151636.7143	490.72439
2011	2	423	151659.5	492.06474
2011	2	424	151797.1429	500.24624
2011	2	425	151814.1786	501.26903
2011	2	426	151828.8214	502.14997
2011	2	427	151843.5	503.03474
2011	2	428	151875.7857	504.98673
2011	2	429	151916.0357	507.43172
2011	2	430	151937.4286	508.73643
2011	2	431	151962.7857	510.28761
2011	2	432	151987.6429	511.81316
2011	2	433	152015.8214	513.54851
2011	2	434	152045.1429	515.36099
2011	2	435	152067.3929	516.74097
2011	2	436	152079.2857	517.48021
2011	2	437	152104.25	519.03567
2011	2	438	152126.6071	520.43296
2011	2	439	152145.1071	521.59225
2011	2	440	152186.25	524.18044
2011	2	441	152209.6429	525.65819
2011	2	442	152215.7857	526.04698
2011	2	443	152235.2143	527.2787
2011	2	444	152254.0714	528.47716
2011	2	445	152257.6786	528.70674
2011	2	446	152293.2143	530.97424
2011	2	447	152322.1786	532.83017
2011	2	448	152327.6786	533.18338
2011	2	449	152339.5714	533.948
2011	2	450	152347.8571	534.4814
2011	2	451	152352.9286	534.80816
2011	2	452	152357.6429	535.11211
2011	2	453	152368.4286	535.80819
2011	2	454	152374.2143	536.18199
2011	2	455	152380	536.55607
2011	2	456	152404.5	538.14325
2011	2	457	152417.5714	538.99211
2011	2	458	152423.5357	539.37992
2011	2	459	152433.7143	540.04243

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	460	152438.3929	540.34725
2011	2	461	152442.6429	540.6243
2011	2	462	152456.8929	541.55436
2011	2	463	152496.8214	544.16958
2011	2	464	152525.7857	546.07515
2011	2	465	152564.6071	548.64049
2011	2	466	152569.1786	548.94342
2011	2	467	152573.0714	549.20153
2011	2	468	152582.3929	549.82009
2011	2	469	152767.1071	562.23311
2011	2	470	152779.3571	563.06689
2011	2	471	152783.1071	563.32239
2011	2	472	152786	563.51958
2011	2	473	152802	564.61152
2011	2	474	152803.3929	564.70669
2011	2	475	152804.6071	564.78967
2011	2	476	152804.6071	564.78967
2011	2	477	152805.2143	564.83116
2011	2	478	152807.5	564.9874
2011	2	479	152807.9643	565.01915
2011	2	480	152807.9643	565.01915
2011	2	481	152807.9643	565.01915
2011	2	482	152808.5714	565.06066
2011	2	483	152809.25	565.10706
2011	2	484	152809.25	565.10706
2011	2	485	152838.25	567.09386
2011	2	486	152846.7143	567.67516
2011	2	487	152855.1786	568.25711
2011	2	488	152855.2143	568.25956
2011	2	489	152855.2143	568.25956
2011	2	490	152866.5	569.03648
2011	2	491	152880.6429	570.01169
2011	2	492	152883.6429	570.21879
2011	2	493	152892.2857	570.81586
2011	2	494	152904.0714	571.63114
2011	2	495	152907.0714	571.83886
2011	2	496	152909.9643	572.03924
2011	2	497	152919.5	572.70029
2011	2	498	152955.5	575.20332
2011	2	499	152955.5	575.20332
2011	2	500	152955.5	575.20332
2011	2	501	152955.5	575.20332
2011	2	502	152955.5	575.20332
2011	2	503	152955.5	575.20332
2011	2	504	152955.5	575.20332
2011	2	505	152955.5	575.20332
2011	2	506	152955.5	575.20332
2011	2	507	152955.5	575.20332
2011	2	508	152955.5357	575.20581
2011	2	509	152955.5714	575.20829
2011	2	510	152955.5714	575.20829

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	511	153020.9643	579.785
2011	2	512	153020.9643	579.785
2011	2	513	153020.9643	579.785
2011	2	514	153038.9643	581.0516
2011	2	515	153038.9643	581.0516
2011	2	516	153038.9643	581.0516
2011	2	517	153038.9643	581.0516
2011	2	518	153038.9643	581.0516
2011	2	519	153044.9286	581.47194
2011	2	520	153044.9286	581.47194
2011	2	521	153044.9286	581.47194
2011	2	522	153050.9286	581.89513
2011	2	523	153062.8214	582.73492
2011	2	524	153128.8929	587.42407
2011	2	525	153134.9643	587.85699
2011	2	526	153140.9643	588.28514
2011	2	527	153158.8571	589.56394
2011	2	528	153164.8571	589.99343
2011	2	529	153164.8571	589.99343
2011	2	530	153164.8571	589.99343
2011	2	531	153164.8571	589.99343
2011	2	532	153208.8929	593.15578
2011	2	533	153220.8214	594.01552
2011	2	534	153238.6786	595.30505
2011	2	535	153238.6786	595.30505
2011	2	536	153255.7143	596.53805
2011	2	537	153279.75	598.28232
2011	2	538	153309.0357	600.41495
2011	2	539	153331.3214	602.04326
2011	2	540	153359.75	604.12724
2011	2	541	153376.4286	605.35346
2011	2	542	153376.4286	605.35346
2011	2	543	153376.4643	605.35609
2011	2	544	153377.2143	605.41129
2011	2	545	153382.7857	605.82154
2011	2	546	153389.1429	606.29001
2011	2	547	153389.1429	606.29001
2011	2	548	153405.8571	607.52354
2011	2	549	153422.5357	608.75712
2011	2	550	153453.8214	611.07826
2011	2	551	153482.8571	613.24091
2011	2	552	153482.8571	613.24091
2011	2	553	153485.8571	613.46482
2011	2	554	153502.5	614.70858
2011	2	555	153502.5	614.70858
2011	2	556	153503.25	614.7647
2011	2	557	153504	614.82081
2011	2	558	153515	615.6445
2011	2	559	153520.7857	616.07822
2011	2	560	153525.1429	616.40505
2011	2	561	153528.0357	616.62215

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	562	153549.25	618.21672
2011	2	563	153550.8214	618.33501
2011	2	564	153554.1786	618.5878
2011	2	565	153560.8929	619.09371
2011	2	566	153572.6429	619.98012
2011	2	567	153582.1429	620.69778
2011	2	568	153591.9286	621.43795
2011	2	569	153600.3571	622.07622
2011	2	570	153610.6429	622.85607
2011	2	571	153619.5	623.52844
2011	2	572	153630.1071	624.33468
2011	2	573	153643.9643	625.38962
2011	2	574	153656.8929	626.37558
2011	2	575	153699.4643	629.63386
2011	2	576	153711.1429	630.53085
2011	2	577	153723.3571	631.47044
2011	2	578	153732.4286	632.16923
2011	2	579	153739.3214	632.70074
2011	2	580	153746.7857	633.27686
2011	2	581	153752.7143	633.73485
2011	2	582	153759.0357	634.22357
2011	2	583	153763.8214	634.59382
2011	2	584	153771.6071	635.19668
2011	2	585	153775.3929	635.49002
2011	2	586	153778.25	635.71152
2011	2	587	153779.4286	635.80291
2011	2	588	153779.4286	635.80291
2011	2	589	153779.4286	635.80291
2011	2	590	153779.4286	635.80291
2011	2	591	153779.4286	635.80291
2011	2	592	153785.1429	636.2462
2011	2	593	153789.25	636.56502
2011	2	594	153789.25	636.56502
2011	2	595	153790	636.62326
2011	2	596	153797.6071	637.21428
2011	2	597	153797.6071	637.21428
2011	2	598	153805.8214	637.85313
2011	2	599	153806.5714	637.91149
2011	2	600	153806.5714	637.91149
2011	2	601	153823	639.19135
2011	2	602	153823.75	639.24984
2011	2	603	153823.75	639.24984
2011	2	604	153827.8571	639.57027
2011	2	605	153834.9643	640.12514
2011	2	606	153842.6786	640.72799
2011	2	607	153861.6786	642.21537
2011	2	608	153865.7857	642.53737
2011	2	609	153880.25	643.67275
2011	2	610	153880.25	643.67275
2011	2	611	153885.3929	644.07695
2011	2	612	153886.1429	644.13592

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	613	153896.4286	644.94521
2011	2	614	153903.2857	645.48534
2011	2	615	153923.6786	647.09449
2011	2	616	153926.25	647.2977
2011	2	617	153937.3929	648.17905
2011	2	618	153946.6071	648.90882
2011	2	619	153962.3571	650.15825
2011	2	620	153969.0357	650.68882
2011	2	621	153975.0357	651.16587
2011	2	622	153991.8214	652.50246
2011	2	623	153991.8214	652.50246
2011	2	624	154006.2143	653.65084
2011	2	625	154010.3214	653.97893
2011	2	626	154015.4643	654.39001
2011	2	627	154018.0357	654.59565
2011	2	628	154033.2857	655.81662
2011	2	629	154053.8214	657.46461
2011	2	630	154065.8214	658.42965
2011	2	631	154081.5714	659.69853
2011	2	632	154095.9643	660.86035
2011	2	633	154100.0714	661.19228
2011	2	634	154102.6429	661.40019
2011	2	635	154120.2857	662.82855
2011	2	636	154126.9643	663.3701
2011	2	637	154133.8214	663.92661
2011	2	638	154163.9643	666.37884
2011	2	639	154180.6429	667.73983
2011	2	640	154198.9286	669.23534
2011	2	641	154210.7857	670.20699
2011	2	642	154214.2143	670.48822
2011	2	643	154221.9286	671.12146
2011	2	644	154224.5	671.33268
2011	2	645	154227.0714	671.54397
2011	2	646	154237.4286	672.39572
2011	2	647	154262.9643	674.5006
2011	2	648	154262.9643	674.5006
2011	2	649	154268.1071	674.92537
2011	2	650	154279.7857	675.89099
2011	2	651	154297.1071	677.32588
2011	2	652	154297.1071	677.32588
2011	2	653	154302.1071	677.74067
2011	2	654	154306.2143	678.0816
2011	2	655	154316.5	678.93619
2011	2	656	154323.5	679.51844
2011	2	657	154323.5	679.51844
2011	2	658	154327.6071	679.86031
2011	2	659	154327.6071	679.86031
2011	2	660	154327.6071	679.86031
2011	2	661	154352.6786	681.95117
2011	2	662	154352.6786	681.95117
2011	2	663	154359.4643	682.51824

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	664	154369.8214	683.38474
2011	2	665	154375.5714	683.86629
2011	2	666	154380.5714	684.28533
2011	2	667	154382.2143	684.42307
2011	2	668	154398.3214	685.7751
2011	2	669	154403.3214	686.19538
2011	2	670	154408.6786	686.64597
2011	2	671	154415.75	687.24124
2011	2	672	154417.4643	687.38563
2011	2	673	154417.4643	687.38563
2011	2	674	154417.4643	687.38563
2011	2	675	154428.1786	688.28879
2011	2	676	154433.5357	688.74084
2011	2	677	154435.1786	688.87953
2011	2	678	154435.1786	688.87953
2011	2	679	154438.4643	689.157
2011	2	680	154438.4643	689.157
2011	2	681	154438.4643	689.157
2011	2	682	154440.1071	689.29578
2011	2	683	154440.1071	689.29578
2011	2	684	154443.3929	689.57343
2011	2	685	154445.0357	689.7123
2011	2	686	154446.75	689.85724
2011	2	687	154448.4643	690.00221
2011	2	688	154448.4643	690.00221
2011	2	689	154448.4643	690.00221
2011	2	690	154448.4643	690.00221
2011	2	691	154451.8929	690.29225
2011	2	692	154522.5357	696.29702
2011	2	693	154522.5357	696.29702
2011	2	694	154522.5357	696.29702
2011	2	695	154522.5357	696.29702
2011	2	696	154522.5357	696.29702
2011	2	697	154522.5357	696.29702
2011	2	698	154522.5357	696.29702
2011	2	699	154522.5357	696.29702
2011	2	700	154522.5357	696.29702
2011	2	701	154522.5357	696.29702
2011	2	702	154522.5357	696.29702
2011	2	703	154522.5357	696.29702
2011	2	704	154522.5357	696.29702
2011	2	705	154522.5357	696.29702
2011	2	706	154522.5357	696.29702
2011	2	707	154522.5357	696.29702
2011	2	708	154522.5357	696.29702
2011	2	709	154522.5357	696.29702
2011	2	710	154522.5357	696.29702
2011	2	711	154522.5357	696.29702
2011	2	712	154522.5357	696.29702
2011	2	713	154522.5357	696.29702
2011	2	714	154522.5357	696.29702

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	715	154522.5357	696.29702
2011	2	716	154522.5357	696.29702
2011	2	717	154522.5357	696.29702
2011	2	718	154522.5357	696.29702
2011	2	719	154522.5357	696.29702
2011	2	720	154523.7143	696.39767
2011	2	721	154523.7143	696.39767
2011	2	722	154523.7143	696.39767
2011	2	723	154525.8571	696.58071
2011	2	724	154525.8571	696.58071
2011	2	725	154525.8571	696.58071
2011	2	726	154525.8571	696.58071
2011	2	727	154526.6429	696.64783
2011	2	728	154526.6429	696.64783
2011	2	729	154529.9643	696.93167
2011	2	730	154532.1071	697.11485
2011	2	731	154537.3571	697.56387
2011	2	732	154540.8571	697.86338
2011	2	733	154541.25	697.89701
2011	2	734	154548.6429	698.53013
2011	2	735	154548.6429	698.53013
2011	2	736	154548.6429	698.53013
2011	2	737	154551.1786	698.74743
2011	2	738	154551.1786	698.74743
2011	2	739	154551.1786	698.74743
2011	2	740	154551.1786	698.74743
2011	2	741	154552.9286	698.89744
2011	2	742	154552.9286	698.89744
2011	2	743	154552.9286	698.89744
2011	2	744	154552.9286	698.89744
2011	2	745	154552.9286	698.89744
2011	2	746	154556.8214	699.23126
2011	2	747	154557.2143	699.26495
2011	2	748	154557.2143	699.26495
2011	2	749	154557.6071	699.29865
2011	2	750	154558	699.33235
2011	2	751	154558.3929	699.36606
2011	2	752	154561.8929	699.66639
2011	2	753	154561.8929	699.66639
2011	2	754	154561.8929	699.66639
2011	2	755	154562.2857	699.70011
2011	2	756	154564.0357	699.85033
2011	2	757	154566.1786	700.03433
2011	2	758	154566.9643	700.1018
2011	2	759	154566.9643	700.1018
2011	2	760	154570.4643	700.40247
2011	2	761	154570.4643	700.40247
2011	2	762	154571.6429	700.50375
2011	2	763	154573.3929	700.65415
2011	2	764	154573.7857	700.68792
2011	2	765	154573.7857	700.68792

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	766	154651.0357	707.36178
2011	2	767	154651.0357	707.36178
2011	2	768	154651.0357	707.36178
2011	2	769	154651.0357	707.36178
2011	2	770	154651.0357	707.36178
2011	2	771	154652.7857	707.51375
2011	2	772	154652.7857	707.51375
2011	2	773	154654.5357	707.66575
2011	2	774	154654.5357	707.66575
2011	2	775	154654.5357	707.66575
2011	2	776	154654.5357	707.66575
2011	2	777	154654.5357	707.66575
2011	2	778	154654.5357	707.66575
2011	2	779	154654.5357	707.66575
2011	2	780	154654.9286	707.69987
2011	2	781	154654.9286	707.69987
2011	2	782	154654.9286	707.69987
2011	2	783	154654.9286	707.69987
2011	2	784	154654.9286	707.69987
2011	2	785	154654.9286	707.69987
2011	2	786	154654.9286	707.69987
2011	2	787	154654.9286	707.69987
2011	2	788	154654.9286	707.69987
2011	2	789	154654.9286	707.69987
2011	2	790	154654.9286	707.69987
2011	2	791	154654.9286	707.69987
2011	2	792	154654.9286	707.69987
2011	2	793	154684.1786	710.24565
2011	2	794	154684.1786	710.24565
2011	2	795	154684.1786	710.24565
2011	2	796	154684.1786	710.24565
2011	2	797	154684.1786	710.24565
2011	2	798	154684.1786	710.24565
2011	2	799	154684.1786	710.24565
2011	2	800	154684.1786	710.24565
2011	2	801	154684.1786	710.24565
2011	2	802	154684.1786	710.24565
2011	2	803	154684.1786	710.24565
2011	2	804	154684.1786	710.24565
2011	2	805	154684.1786	710.24565
2011	2	806	154684.1786	710.24565
2011	2	807	154684.1786	710.24565
2011	2	808	154684.1786	710.24565
2011	2	809	154684.1786	710.24565
2011	2	810	154684.1786	710.24565
2011	2	811	154684.1786	710.24565
2011	2	812	154684.1786	710.24565
2011	2	813	154684.1786	710.24565
2011	2	814	154684.1786	710.24565
2011	2	815	154684.1786	710.24565
2011	2	816	154684.1786	710.24565

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	817	154684.1786	710.24565
2011	2	818	154684.1786	710.24565
2011	2	819	154684.1786	710.24565
2011	2	820	154684.1786	710.24565
2011	2	821	154684.1786	710.24565
2011	2	822	154684.1786	710.24565
2011	2	823	154684.1786	710.24565
2011	2	824	154684.1786	710.24565
2011	2	825	154684.1786	710.24565
2011	2	826	154684.1786	710.24565
2011	2	827	154684.1786	710.24565
2011	2	828	154684.1786	710.24565
2011	2	829	154684.1786	710.24565
2011	2	830	154756.1786	716.55347
2011	2	831	154756.1786	716.55347
2011	2	832	154756.1786	716.55347
2011	2	833	154756.1786	716.55347
2011	2	834	154756.1786	716.55347
2011	2	835	154756.1786	716.55347
2011	2	836	154756.1786	716.55347
2011	2	837	154756.1786	716.55347
2011	2	838	154756.1786	716.55347
2011	2	839	154816.1786	721.85516
2011	2	840	154816.1786	721.85516
2011	2	841	154816.1786	721.85516
2011	2	842	154816.1786	721.85516
2011	2	843	154816.1786	721.85516
2011	2	844	154816.1786	721.85516
2011	2	845	154816.1786	721.85516
2011	2	846	154816.1786	721.85516
2011	2	847	154816.1786	721.85516
2011	2	848	154816.1786	721.85516
2011	2	849	154816.1786	721.85516
2011	2	850	154816.1786	721.85516
2011	2	851	154816.1786	721.85516
2011	2	852	154816.1786	721.85516
2011	2	853	154816.1786	721.85516
2011	2	854	154816.1786	721.85516
2011	2	855	154816.1786	721.85516
2011	2	856	154816.1786	721.85516
2011	2	857	154816.1786	721.85516
2011	2	858	154816.1786	721.85516
2011	2	859	154816.1786	721.85516
2011	2	860	154816.1786	721.85516
2011	2	861	154816.1786	721.85516
2011	2	862	154816.1786	721.85516
2011	2	863	154816.1786	721.85516
2011	2	864	154816.1786	721.85516
2011	2	865	155728.1786	807.73208
2011	2	866	155728.1786	807.73208
2011	2	867	155728.1786	807.73208

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	868	155728.1786	807.73208
2011	2	869	155728.1786	807.73208
2011	2	870	155728.1786	807.73208
2011	2	871	155728.1786	807.73208
2011	2	872	155728.1786	807.73208
2011	2	873	155728.1786	807.73208
2011	2	874	155728.1786	807.73208
2011	2	875	155728.1786	807.73208
2011	2	876	155728.1786	807.73208
2011	2	877	155728.1786	807.73208
2011	2	878	155728.1786	807.73208
2011	2	879	155728.1786	807.73208
2011	2	880	155728.1786	807.73208
2011	2	881	155728.1786	807.73208
2011	2	882	155728.1786	807.73208
2011	2	883	155728.1786	807.73208
2011	2	884	155728.1786	807.73208
2011	2	885	155728.1786	807.73208
2011	2	886	155728.1786	807.73208
2011	2	887	155728.1786	807.73208
2011	2	888	155728.1786	807.73208
2011	2	889	155728.1786	807.73208
2011	2	890	155728.1786	807.73208
2011	2	891	155728.1786	807.73208
2011	2	892	155728.1786	807.73208
2011	2	893	155764.1786	811.33474
2011	2	894	155764.1786	811.33474
2011	2	895	155764.1786	811.33474
2011	2	896	155764.1786	811.33474
2011	2	897	155764.1786	811.33474
2011	2	898	155764.1786	811.33474
2011	2	899	155764.1786	811.33474
2011	2	900	155764.1786	811.33474
2011	2	901	155764.1786	811.33474
2011	2	902	155764.1786	811.33474
2011	2	903	155764.1786	811.33474
2011	2	904	155764.1786	811.33474
2011	2	905	155764.1786	811.33474
2011	2	906	155764.3929	811.35623
2011	2	907	155764.3929	811.35623
2011	2	908	155764.3929	811.35623
2011	2	909	155764.3929	811.35623
2011	2	910	155764.3929	811.35623
2011	2	911	155764.5357	811.37056
2011	2	912	155764.5357	811.37056
2011	2	913	155764.9643	811.41355
2011	2	914	155764.9643	811.41355
2011	2	915	155764.9643	811.41355
2011	2	916	155765.9643	811.51388
2011	2	917	155765.9643	811.51388
2011	2	918	155766.1786	811.53538

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	919	155766.3929	811.55688
2011	2	920	155766.3929	811.55688
2011	2	921	155766.3929	811.55688
2011	2	922	155767.0357	811.62138
2011	2	923	155767.1786	811.63572
2011	2	924	155767.1786	811.63572
2011	2	925	155767.1786	811.63572
2011	2	926	155767.1786	811.63572
2011	2	927	155767.1786	811.63572
2011	2	928	155767.1786	811.63572
2011	2	929	155767.1786	811.63572
2011	2	930	155767.3929	811.65722
2011	2	931	155767.3929	811.65722
2011	2	932	155767.3929	811.65722
2011	2	933	155767.6071	811.67872
2011	2	934	155767.6071	811.67872
2011	2	935	155767.6071	811.67872
2011	2	936	155767.6071	811.67872
2011	2	937	155767.6071	811.67872
2011	2	938	155768.1786	811.73607
2011	2	939	155768.1786	811.73607
2011	2	940	155768.3929	811.75758
2011	2	941	155769.0357	811.8221
2011	2	942	155769.4643	811.86511
2011	2	943	155769.4643	811.86511
2011	2	944	155769.4643	811.86511
2011	2	945	155769.4643	811.86511
2011	2	946	155769.8929	811.90813
2011	2	947	155769.8929	811.90813
2011	2	948	155769.8929	811.90813
2011	2	949	155769.8929	811.90813
2011	2	950	155769.8929	811.90813
2011	2	951	155769.8929	811.90813
2011	2	952	155769.8929	811.90813
2011	2	953	155769.8929	811.90813
2011	2	954	155769.8929	811.90813
2011	2	955	155769.8929	811.90813
2011	2	956	155769.8929	811.90813
2011	2	957	155805.8929	815.53033
2011	2	958	155805.8929	815.53033
2011	2	959	155805.8929	815.53033
2011	2	960	155805.8929	815.53033
2011	2	961	155805.8929	815.53033
2011	2	962	155805.8929	815.53033
2011	2	963	155805.8929	815.53033
2011	2	964	155805.8929	815.53033
2011	2	965	155805.8929	815.53033
2011	2	966	155805.8929	815.53033
2011	2	967	155805.8929	815.53033
2011	2	968	155805.8929	815.53033
2011	2	969	155805.8929	815.53033

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	2	970	155805.8929	815.53033
2011	2	971	155805.8929	815.53033
2011	2	972	155805.8929	815.53033
2011	2	973	155807.6071	815.70323
2011	2	974	155807.6071	815.70323
2011	2	975	155807.6071	815.70323
2011	2	976	155807.6071	815.70323
2011	2	977	155807.6071	815.70323
2011	2	978	155811.0357	816.04916
2011	2	979	155817.8929	816.74149
2011	2	980	155819.6071	816.91466
2011	2	981	155831.4643	818.11352
2011	2	982	155833.1786	818.287
2011	2	983	155836.6786	818.64132
2011	2	984	155836.6786	818.64132
2011	2	985	155838.3929	818.81491
2011	2	986	155838.3929	818.81491
2011	2	987	155841.8929	819.16947
2011	2	988	155859.3214	820.93738
2011	2	989	155866.3214	821.64857
2011	2	990	155880.3214	823.07289
2011	2	991	155880.3214	823.07289
2011	2	992	155887.25	823.77874
2011	2	993	155887.25	823.77874
2011	2	994	155892.4643	824.31037
2011	2	995	155894.1786	824.48523
2011	2	996	155894.1786	824.48523
2011	2	997	155901.1071	825.19234
2011	2	998	155961.6071	831.39394
2011	2	999	155964.1429	831.65493

March 2011

Net Benefit Tab

Effective_month	Test_result
3/1/2011 0:00	\$38.48

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.927081223	1.306849988

Curve Parameters Tab

a	b	c	d
2.365341753	0.000164244	16.91658691	35.99246498

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	1	20158.80645	35.99247
2011	3	2	20635.45161	35.99247
2011	3	3	20635.93548	35.99247
2011	3	4	21933.67742	35.99247
2011	3	5	25514.3871	35.99248
2011	3	6	28723	35.99249
2011	3	7	29969	35.99249
2011	3	8	30124.12903	35.99249
2011	3	9	31740.41935	35.9925
2011	3	10	31747.64516	35.9925
2011	3	11	31747.83871	35.9925
2011	3	12	31793.03226	35.9925
2011	3	13	31864.09677	35.9925
2011	3	14	32134.32258	35.9925
2011	3	15	33377.80645	35.99251
2011	3	16	33705.48387	35.99252
2011	3	17	33705.70968	35.99252
2011	3	18	33776	35.99252
2011	3	19	33821.19355	35.99252
2011	3	20	34938.80645	35.99253
2011	3	21	35617.93548	35.99253
2011	3	22	37203.70968	35.99255
2011	3	23	39084.74194	35.99258
2011	3	24	40841.29032	35.99261
2011	3	25	42912.83871	35.99266
2011	3	26	46074.93548	35.99278
2011	3	27	52234.29032	35.99321
2011	3	28	57425.96774	35.99403
2011	3	29	65149.03226	35.99714
2011	3	30	70393.12903	36.00226
2011	3	31	73477.03226	36.00761
2011	3	32	76494.70968	36.01566
2011	3	33	79208.87097	36.0265
2011	3	34	82589.32258	36.04732
2011	3	35	84991.80645	36.06947
2011	3	36	87839.32258	36.10759
2011	3	37	89490.93548	36.13782
2011	3	38	90553.25806	36.16134
2011	3	39	91759.09677	36.19269
2011	3	40	92765.83871	36.22327
2011	3	41	94097.77419	36.27103
2011	3	42	95269.3871	36.32114
2011	3	43	96414.45161	36.37882
2011	3	44	97812	36.4631
2011	3	45	98921	36.54287
2011	3	46	100197.5806	36.65158
2011	3	47	101171.2903	36.74872
2011	3	48	102318.2258	36.88166
2011	3	49	103263.4516	37.00862
2011	3	50	104281.4839	37.16569
2011	3	51	105767.7097	37.43962

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	52	106865.8387	37.68233
2011	3	53	107728.0323	37.90109
2011	3	54	108318.0323	38.0669
2011	3	55	109214.0968	38.34667
2011	3	56	110095.9355	38.65882
2011	3	57	110792.6452	38.93444
2011	3	58	111437.9677	39.21509
2011	3	59	111985.0968	39.47391
2011	3	60	112578.5484	39.77819
2011	3	61	112991.8387	40.00567
2011	3	62	113431.9355	40.26295
2011	3	63	113799	40.49011
2011	3	64	114846.6129	41.20709
2011	3	65	115252.3548	41.51455
2011	3	66	115749.3871	41.91599
2011	3	67	116469.1613	42.54963
2011	3	68	117013.9677	43.07392
2011	3	69	117606.3226	43.69165
2011	3	70	118099.6774	44.24708
2011	3	71	120429.5161	47.46236
2011	3	72	120820.5484	48.11342
2011	3	73	121214.7742	48.80722
2011	3	74	121584.8065	49.49453
2011	3	75	121925.6774	50.16025
2011	3	76	122287.6452	50.90314
2011	3	77	122635.8065	51.65442
2011	3	78	123037.6452	52.56872
2011	3	79	123346.0968	53.30657
2011	3	80	123653.4194	54.07439
2011	3	81	123946.8065	54.83914
2011	3	82	124197	55.5168
2011	3	83	124392.6129	56.06356
2011	3	84	124643.7742	56.78809
2011	3	85	124773.2903	57.17187
2011	3	86	124915.2903	57.60078
2011	3	87	125082.4194	58.11674
2011	3	88	125220	58.55071
2011	3	89	125316	58.85855
2011	3	90	125392.2258	59.10598
2011	3	91	125495.1935	59.44446
2011	3	92	125574.3548	59.70805
2011	3	93	125643.0968	59.93935
2011	3	94	125713.5806	60.17885
2011	3	95	125780.6129	60.40885
2011	3	96	125852.2903	60.6572
2011	3	97	125884.5806	60.76991
2011	3	98	125916.4516	60.88165
2011	3	99	125972.5484	61.07957
2011	3	100	126031.1613	61.28804
2011	3	101	126170.871	61.79197
2011	3	102	126238.0323	62.03778

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	103	126327.6774	62.36953
2011	3	104	126488.8065	62.97649
2011	3	105	126698.9032	63.78893
2011	3	106	126768.8387	64.06476
2011	3	107	126899.3226	64.58674
2011	3	108	127015	65.05759
2011	3	109	127075.4194	65.3066
2011	3	110	127174.0323	65.7176
2011	3	111	127313.7419	66.30977
2011	3	112	127426.3871	66.79581
2011	3	113	127483.0323	67.04316
2011	3	114	127582.9032	67.4841
2011	3	115	127630.129	67.69479
2011	3	116	127705.3871	68.03345
2011	3	117	127847.6452	68.68351
2011	3	118	127969.129	69.24908
2011	3	119	128034.8065	69.55891
2011	3	120	128170.5806	70.20859
2011	3	121	128379.6774	71.2338
2011	3	122	128568.4516	72.18573
2011	3	123	128716.9355	72.95251
2011	3	124	128804.7097	73.41341
2011	3	125	128986.0323	74.3838
2011	3	126	129187.8387	75.49343
2011	3	127	129393.0323	76.65457
2011	3	128	129682.4194	78.35039
2011	3	129	129919.3226	79.79117
2011	3	130	130069.9355	80.73253
2011	3	131	130214.9355	81.65792
2011	3	132	130338.1613	82.45938
2011	3	133	130450.9032	83.20497
2011	3	134	130626.3226	84.38892
2011	3	135	130718.9032	85.02569
2011	3	136	130905.3548	86.33364
2011	3	137	131011.5806	87.09436
2011	3	138	131092.2258	87.67955
2011	3	139	131194.8387	88.43385
2011	3	140	131354.5484	89.62981
2011	3	141	132119.7419	95.74935
2011	3	142	132459.9355	98.68966
2011	3	143	132663.6129	100.51885
2011	3	144	132890.7097	102.62136
2011	3	145	133120.8387	104.82183
2011	3	146	133361.7097	107.2029
2011	3	147	133622.8065	109.87703
2011	3	148	133941.7419	113.28017
2011	3	149	134116.6774	115.2129
2011	3	150	134331.9677	117.65795
2011	3	151	134494.6129	119.55502
2011	3	152	134606.4516	120.885
2011	3	153	134723	122.29352

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	154	134841.2258	123.74618
2011	3	155	134929.1935	124.84291
2011	3	156	135000.8065	125.74584
2011	3	157	135164.4194	127.84334
2011	3	158	135324.5806	129.94406
2011	3	159	135406	131.03033
2011	3	160	135474.5806	131.95506
2011	3	161	135535.3226	132.78159
2011	3	162	135596.3871	133.61969
2011	3	163	135665.1935	134.57275
2011	3	164	135753.7742	135.81342
2011	3	165	136150.7097	141.56751
2011	3	166	136219.9677	142.60495
2011	3	167	136318.7097	144.1017
2011	3	168	136392	145.22622
2011	3	169	136470.9355	146.45044
2011	3	170	136664.9032	149.5173
2011	3	171	136722.0968	150.43775
2011	3	172	136767.0323	151.16616
2011	3	173	136801.9032	151.73461
2011	3	174	136824.6452	152.10685
2011	3	175	136918.4194	153.65444
2011	3	176	136940.6129	154.02372
2011	3	177	137056.3226	155.96786
2011	3	178	137122.5161	157.0944
2011	3	179	137181.7097	158.11076
2011	3	180	137580.9677	165.19252
2011	3	181	137644.2258	166.35164
2011	3	182	137726.3871	167.87267
2011	3	183	137838.0968	169.96923
2011	3	184	137937.5484	171.86376
2011	3	185	138173.0968	176.45847
2011	3	186	138256.7097	178.12655
2011	3	187	138368.6774	180.39139
2011	3	188	138432.5806	181.70013
2011	3	189	138541.7742	183.96394
2011	3	190	138615.1613	185.50514
2011	3	191	138668.0645	186.6261
2011	3	192	138790.8387	189.26004
2011	3	193	138884.7097	191.30494
2011	3	194	138946.3226	192.66193
2011	3	195	139041.8065	194.78837
2011	3	196	139144.4194	197.10576
2011	3	197	139276.5806	200.14036
2011	3	198	139410.3871	203.27097
2011	3	199	139487.2903	205.09719
2011	3	200	139535.5484	206.25334
2011	3	201	139539.7097	206.3534
2011	3	202	139543.5806	206.44654
2011	3	203	139558.9355	206.81648
2011	3	204	139565	206.96281

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	205	139572.6774	207.14824
2011	3	206	139589.1935	207.54783
2011	3	207	140222.7419	223.60101
2011	3	208	140227.9355	223.73863
2011	3	209	140231.5161	223.83357
2011	3	210	140231.5484	223.83442
2011	3	211	140275.5806	225.00587
2011	3	212	140897.7097	242.35967
2011	3	213	140968.7419	244.43977
2011	3	214	140985.7419	244.9407
2011	3	215	140985.7419	244.9407
2011	3	216	141001.8065	245.41517
2011	3	217	141025.2581	246.10975
2011	3	218	141027.8065	246.18537
2011	3	219	141466.5484	259.61784
2011	3	220	141525.2258	261.47822
2011	3	221	141526.0645	261.50492
2011	3	222	141527.0968	261.53779
2011	3	223	141530.9355	261.66007
2011	3	224	141534.9355	261.78755
2011	3	225	141536.7097	261.84412
2011	3	226	141537.5484	261.87087
2011	3	227	141549.0323	262.23741
2011	3	228	141569.4839	262.89166
2011	3	229	141581.7742	263.28573
2011	3	230	141603.9032	263.99701
2011	3	231	141626.0323	264.7105
2011	3	232	141648.1613	265.42623
2011	3	233	141702.129	267.18115
2011	3	234	141724.1935	267.9025
2011	3	235	141795.2903	270.24219
2011	3	236	141822.129	271.13154
2011	3	237	141826.9677	271.29224
2011	3	238	141831.9677	271.45841
2011	3	239	141832	271.45948
2011	3	240	141837	271.62577
2011	3	241	141850.4516	272.07372
2011	3	242	141850.6129	272.07909
2011	3	243	141850.7419	272.0834
2011	3	244	141865.8065	272.58609
2011	3	245	141885.8065	273.25513
2011	3	246	141916.0645	274.27093
2011	3	247	141933.871	274.87074
2011	3	248	141957.7097	275.67612
2011	3	249	141991.7742	276.83168
2011	3	250	142036.0968	278.34357
2011	3	251	142063.9677	279.29913
2011	3	252	142101.9677	280.60805
2011	3	253	142126.9355	281.4719
2011	3	254	142152.871	282.37246
2011	3	255	142157.5484	282.53522

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	256	142172.0968	283.04217
2011	3	257	142186.3226	283.53888
2011	3	258	142228.5484	285.01914
2011	3	259	142243.4516	285.54369
2011	3	260	142271.2903	286.52651
2011	3	261	142296.4516	287.41813
2011	3	262	142312.3548	287.98331
2011	3	263	142337.0645	288.86399
2011	3	264	142361.8387	289.75006
2011	3	265	142381.2581	290.44678
2011	3	266	142384.9032	290.57777
2011	3	267	142392.7419	290.85969
2011	3	268	142394.2581	290.91425
2011	3	269	142400.5161	291.1396
2011	3	270	142406.0645	291.33955
2011	3	271	142414.7419	291.65259
2011	3	272	142470.3548	293.66795
2011	3	273	142493.129	294.49785
2011	3	274	142508.6452	295.06478
2011	3	275	142539.129	296.18225
2011	3	276	142544.0968	296.36481
2011	3	277	142594.4839	298.22376
2011	3	278	142594.4839	298.22376
2011	3	279	142594.4839	298.22376
2011	3	280	142600.6129	298.45079
2011	3	281	142600.6129	298.45079
2011	3	282	142639.3226	299.88917
2011	3	283	142640.0968	299.91802
2011	3	284	142651.6129	300.34751
2011	3	285	142652.4516	300.37881
2011	3	286	142660.4516	300.67761
2011	3	287	142662.0645	300.7379
2011	3	288	142667.4516	300.93934
2011	3	289	142673.9032	301.1808
2011	3	290	142677	301.29677
2011	3	291	142677.8387	301.32819
2011	3	292	142679.4516	301.38862
2011	3	293	142679.4516	301.38862
2011	3	294	142683.1613	301.52766
2011	3	295	142683.1613	301.52766
2011	3	296	142683.1613	301.52766
2011	3	297	142683.1613	301.52766
2011	3	298	142684	301.55911
2011	3	299	142696	302.00944
2011	3	300	142696.0323	302.01065
2011	3	301	142696.0968	302.01308
2011	3	302	142696.0968	302.01308
2011	3	303	142714.1613	302.69244
2011	3	304	142714.1613	302.69244
2011	3	305	142773.3548	304.93076
2011	3	306	142773.3548	304.93076

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	307	142773.3548	304.93076
2011	3	308	142785.8065	305.40398
2011	3	309	142801.9677	306.01944
2011	3	310	142810.4839	306.34431
2011	3	311	142810.9355	306.36155
2011	3	312	142850.9032	307.89159
2011	3	313	142871.129	308.66916
2011	3	314	142896.3548	309.64207
2011	3	315	142989.4839	313.26406
2011	3	316	143022.129	314.54501
2011	3	317	143050.129	315.64841
2011	3	318	143078	316.75106
2011	3	319	143104.3226	317.79645
2011	3	320	143111.6774	318.08923
2011	3	321	143149.1935	319.58745
2011	3	322	143199.4516	321.607
2011	3	323	143216.3871	322.29076
2011	3	324	143240.5806	323.27041
2011	3	325	143254.1613	323.82178
2011	3	326	143258.9032	324.01455
2011	3	327	143277.6452	324.77773
2011	3	328	143333.9677	327.08338
2011	3	329	143423.871	330.80191
2011	3	330	143438.7742	331.4229
2011	3	331	143444.7419	331.67193
2011	3	332	143450.5484	331.91443
2011	3	333	143465.3871	332.53507
2011	3	334	143474.3871	332.91213
2011	3	335	143542.6774	335.78888
2011	3	336	143554.0323	336.2699
2011	3	337	143558.2903	336.45048
2011	3	338	143591.7419	337.87292
2011	3	339	143608.4839	338.58736
2011	3	340	143643.2581	340.07669
2011	3	341	143672.8387	341.34937
2011	3	342	143697.4516	342.41237
2011	3	343	143717.2258	343.26907
2011	3	344	143742.4516	344.36544
2011	3	345	143802.129	346.97475
2011	3	346	143859.0323	349.48332
2011	3	347	143939.3871	353.06025
2011	3	348	143967.9355	354.34086
2011	3	349	144010.871	356.27659
2011	3	350	144060.5806	358.53243
2011	3	351	144133.3226	361.86216
2011	3	352	144150.3548	362.64675
2011	3	353	144161	363.13809
2011	3	354	144174	363.73911
2011	3	355	144194.1613	364.6734
2011	3	356	144208.8065	365.35374
2011	3	357	144299.1613	369.58242

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	358	144323.4516	370.72846
2011	3	359	144394.4839	374.10247
2011	3	360	144437.129	376.14441
2011	3	361	144470.5484	377.75322
2011	3	362	144499.3226	379.1445
2011	3	363	144514.871	379.89865
2011	3	364	144553.5806	381.78341
2011	3	365	144587.5484	383.44578
2011	3	366	144677.7097	387.89713
2011	3	367	144728.5806	390.4338
2011	3	368	144780.3548	393.03429
2011	3	369	144820.9355	395.08588
2011	3	370	144858.9355	397.01769
2011	3	371	144883.7742	398.28603
2011	3	372	144949.9032	401.68455
2011	3	373	144964.7097	402.44984
2011	3	374	144985.871	403.54638
2011	3	375	145001.6129	404.36422
2011	3	376	145026.5161	405.66174
2011	3	377	145061.129	407.47275
2011	3	378	145087	408.83216
2011	3	379	145114.129	410.26302
2011	3	380	145131.7097	411.1932
2011	3	381	145148.7742	412.09828
2011	3	382	145158.129	412.59538
2011	3	383	145168.5484	413.14982
2011	3	384	145173.9032	413.43508
2011	3	385	145253.0968	417.67911
2011	3	386	145258.2903	417.9591
2011	3	387	145261.3871	418.12615
2011	3	388	145262.9032	418.20796
2011	3	389	145272.7419	418.73927
2011	3	390	145280.3548	419.1509
2011	3	391	145312.1613	420.87546
2011	3	392	145399.5806	425.65545
2011	3	393	145444.7742	428.14981
2011	3	394	145459.3548	428.95796
2011	3	395	145467.9677	429.43613
2011	3	396	145487.2258	430.50738
2011	3	397	145496.7097	431.03601
2011	3	398	145546.7742	433.83834
2011	3	399	145588.1935	436.17178
2011	3	400	145608.4516	437.31803
2011	3	401	145643.4839	439.30801
2011	3	402	145658.871	440.18517
2011	3	403	145681.2258	441.46295
2011	3	404	145834.871	450.35506
2011	3	405	145855.6774	451.57412
2011	3	406	145888.2258	453.48834
2011	3	407	145901.5161	454.2725
2011	3	408	145919.7097	455.34835

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	409	145931.7419	456.06138
2011	3	410	145950.4194	457.1706
2011	3	411	145958.4839	457.65044
2011	3	412	145965.5161	458.06931
2011	3	413	145973.8387	458.56557
2011	3	414	145981.6129	459.02967
2011	3	415	145991.3548	459.61194
2011	3	416	146001.2581	460.20468
2011	3	417	146011.3548	460.80986
2011	3	418	146151.1613	469.27884
2011	3	419	146165.871	470.17966
2011	3	420	146185.7742	471.40151
2011	3	421	146196.2258	472.04451
2011	3	422	146207.0323	472.71033
2011	3	423	146224.3226	473.77777
2011	3	424	146238.6452	474.66397
2011	3	425	146259.5161	475.95855
2011	3	426	146275.129	476.92948
2011	3	427	146286.871	477.6611
2011	3	428	146308.129	478.98874
2011	3	429	146344.7742	481.28673
2011	3	430	146363.7419	482.48087
2011	3	431	146391.6452	484.24336
2011	3	432	146404.0968	485.03211
2011	3	433	146426.3871	486.44755
2011	3	434	146448.4516	487.85305
2011	3	435	146473	489.42192
2011	3	436	146493.4839	490.73521
2011	3	437	146516.1613	492.19356
2011	3	438	146534.3226	493.36486
2011	3	439	146558.3548	494.91943
2011	3	440	146589.1613	496.91992
2011	3	441	146628.2258	499.46923
2011	3	442	146645	500.56821
2011	3	443	146666.5161	501.98169
2011	3	444	146690.7419	503.57832
2011	3	445	146707.129	504.66143
2011	3	446	146730	506.1773
2011	3	447	146742.5484	507.01107
2011	3	448	146756.9355	507.96884
2011	3	449	146763.7419	508.42263
2011	3	450	146772.0645	508.9781
2011	3	451	146789.3226	510.13203
2011	3	452	146798.2903	510.73275
2011	3	453	146801.3226	510.93604
2011	3	454	146807.9032	511.37753
2011	3	455	146819.5806	512.16197
2011	3	456	146823.9032	512.45267
2011	3	457	146868.6129	515.46989
2011	3	458	146877.871	516.09705
2011	3	459	146885.0968	516.58712

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	460	146919.9677	518.95915
2011	3	461	146922.9355	519.16156
2011	3	462	146927.1935	519.45213
2011	3	463	147144.9032	534.54382
2011	3	464	147155.7097	535.30508
2011	3	465	147189.8387	537.71694
2011	3	466	147202.4839	538.61351
2011	3	467	147218.6452	539.76172
2011	3	468	147232.1935	540.72631
2011	3	469	147236.8065	541.05515
2011	3	470	147250.0968	542.00378
2011	3	471	147261.871	542.84568
2011	3	472	147305.7097	545.99265
2011	3	473	147312.0968	546.45277
2011	3	474	147321.3871	547.12279
2011	3	475	147326.5484	547.4954
2011	3	476	147337.0968	548.25777
2011	3	477	147338.6452	548.36977
2011	3	478	147339.9032	548.46079
2011	3	479	147372.3548	550.81425
2011	3	480	147376.5484	551.11917
2011	3	481	147383.0968	551.59566
2011	3	482	147391.4194	552.20189
2011	3	483	147391.9032	552.23716
2011	3	484	147400.8387	552.88887
2011	3	485	147404.7742	553.17616
2011	3	486	147410.2258	553.5744
2011	3	487	147413.3871	553.80548
2011	3	488	147415.3226	553.947
2011	3	489	147416.5806	554.03901
2011	3	490	147416.6129	554.04137
2011	3	491	147416.6129	554.04137
2011	3	492	147455.5484	556.89711
2011	3	493	147455.5484	556.89711
2011	3	494	147456.1613	556.94219
2011	3	495	147456.1613	556.94219
2011	3	496	147456.1935	556.94456
2011	3	497	147459.6774	557.20088
2011	3	498	147460.2903	557.24598
2011	3	499	147463.1935	557.4597
2011	3	500	147463.1935	557.4597
2011	3	501	147466.0323	557.66874
2011	3	502	147466.0323	557.66874
2011	3	503	147468.9677	557.885
2011	3	504	147469.6452	557.93492
2011	3	505	147539	563.07105
2011	3	506	147539	563.07105
2011	3	507	147539.0323	563.07345
2011	3	508	147557.0323	564.4147
2011	3	509	147557.0968	564.41951
2011	3	510	147557.0968	564.41951

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	511	147557.129	564.42192
2011	3	512	147557.129	564.42192
2011	3	513	147557.129	564.42192
2011	3	514	147557.1613	564.42432
2011	3	515	147557.1613	564.42432
2011	3	516	147557.1935	564.42673
2011	3	517	147593.1935	567.11954
2011	3	518	147598.5161	567.51883
2011	3	519	147622.5806	569.32787
2011	3	520	147625.2581	569.52953
2011	3	521	147630.6774	569.93793
2011	3	522	147634.9032	570.2566
2011	3	523	147649.6774	571.37223
2011	3	524	147657.7419	571.98218
2011	3	525	147702.0968	575.34936
2011	3	526	147705.0323	575.57295
2011	3	527	147708.0323	575.80155
2011	3	528	147713.3871	576.20983
2011	3	529	147723.4194	576.97557
2011	3	530	147746.9355	578.77477
2011	3	531	147789.0968	582.01549
2011	3	532	147794.4516	582.42847
2011	3	533	147799.4516	582.81436
2011	3	534	147840.8387	586.01907
2011	3	535	147909.7742	591.39867
2011	3	536	147915	591.80862
2011	3	537	147925.5161	592.6345
2011	3	538	147980.0645	596.93817
2011	3	539	147999.8387	598.50649
2011	3	540	147999.8387	598.50649
2011	3	541	147999.8387	598.50649
2011	3	542	148024.7419	600.48784
2011	3	543	148064.6452	603.67718
2011	3	544	148064.6452	603.67718
2011	3	545	148064.6774	603.67976
2011	3	546	148064.7419	603.68493
2011	3	547	148064.8065	603.6901
2011	3	548	148064.8065	603.6901
2011	3	549	148064.8065	603.6901
2011	3	550	148064.8065	603.6901
2011	3	551	148064.8065	603.6901
2011	3	552	148100.8065	606.58299
2011	3	553	148100.8065	606.58299
2011	3	554	148100.8065	606.58299
2011	3	555	148118.8065	608.03496
2011	3	556	148118.8065	608.03496
2011	3	557	148118.8065	608.03496
2011	3	558	148118.8065	608.03496
2011	3	559	148118.8065	608.03496
2011	3	560	148118.8065	608.03496
2011	3	561	148118.8065	608.03496

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	562	148119.4839	608.08968
2011	3	563	148121.0323	608.21476
2011	3	564	148126.9677	608.69451
2011	3	565	148136.1613	609.43838
2011	3	566	148160.1935	611.38748
2011	3	567	148177.3548	612.78336
2011	3	568	148216.0968	615.94707
2011	3	569	148232.0968	617.2587
2011	3	570	148244.5484	618.2815
2011	3	571	148255.8065	619.20781
2011	3	572	148265.7097	620.02386
2011	3	573	148278.2581	621.05952
2011	3	574	148290.3871	622.06231
2011	3	575	148302.1935	623.04009
2011	3	576	148313.6452	623.99003
2011	3	577	148326.4839	625.05687
2011	3	578	148336.2903	625.87305
2011	3	579	148342.2258	626.3676
2011	3	580	148343.5161	626.47516
2011	3	581	148345.4194	626.63386
2011	3	582	148347.0968	626.77376
2011	3	583	148347.7742	626.83027
2011	3	584	148347.7742	626.83027
2011	3	585	148349.129	626.9433
2011	3	586	148350.4839	627.05636
2011	3	587	148355.2258	627.45222
2011	3	588	148355.9032	627.50879
2011	3	589	148356.5806	627.56537
2011	3	590	148356.5806	627.56537
2011	3	591	148356.5806	627.56537
2011	3	592	148356.5806	627.56537
2011	3	593	148356.5806	627.56537
2011	3	594	148357.2581	627.62195
2011	3	595	148357.2581	627.62195
2011	3	596	148357.2581	627.62195
2011	3	597	148357.9355	627.67854
2011	3	598	148358.6129	627.73514
2011	3	599	148358.6129	627.73514
2011	3	600	148358.6129	627.73514
2011	3	601	148358.6129	627.73514
2011	3	602	148361.3226	627.96157
2011	3	603	148362	628.01819
2011	3	604	148364.7097	628.24474
2011	3	605	148365.3871	628.30139
2011	3	606	148366.0645	628.35804
2011	3	607	148367.4194	628.47137
2011	3	608	148368.0968	628.52804
2011	3	609	148368.7742	628.58471
2011	3	610	148369.4516	628.64139
2011	3	611	148370.129	628.69808
2011	3	612	148377.2258	629.29227

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	613	148379.9355	629.5193
2011	3	614	148379.9355	629.5193
2011	3	615	148380.6129	629.57607
2011	3	616	148380.6129	629.57607
2011	3	617	148384.3226	629.88706
2011	3	618	148384.3226	629.88706
2011	3	619	148384.3226	629.88706
2011	3	620	148388.0323	630.19821
2011	3	621	148388.0323	630.19821
2011	3	622	148391.7419	630.50952
2011	3	623	148391.7419	630.50952
2011	3	624	148391.7419	630.50952
2011	3	625	148403.3548	631.48511
2011	3	626	148421.9032	633.04667
2011	3	627	148436.7419	634.29887
2011	3	628	148442.7742	634.80867
2011	3	629	148461.9677	636.43364
2011	3	630	148465.6774	636.74822
2011	3	631	148497.0323	639.41368
2011	3	632	148503.0645	639.92783
2011	3	633	148506.1613	640.19195
2011	3	634	148525.1935	641.81773
2011	3	635	148544.2258	643.44789
2011	3	636	148581.8065	646.67965
2011	3	637	148588	647.21392
2011	3	638	148606.4194	648.80556
2011	3	639	148623.4516	650.28103
2011	3	640	148635.8387	651.35633
2011	3	641	148657.5161	653.24264
2011	3	642	148666.8065	654.05282
2011	3	643	148679.0323	655.12063
2011	3	644	148689.0968	656.00105
2011	3	645	148692.1935	656.2722
2011	3	646	148701.4839	657.08636
2011	3	647	148703.8065	657.29007
2011	3	648	148728.5806	659.46711
2011	3	649	148734.6129	659.99835
2011	3	650	148740.0323	660.476
2011	3	651	148742.3548	660.68082
2011	3	652	148748.3871	661.2131
2011	3	653	148748.3871	661.2131
2011	3	654	148752.0968	661.54066
2011	3	655	148752.0968	661.54066
2011	3	656	148752.0968	661.54066
2011	3	657	148752.0968	661.54066
2011	3	658	148766.9355	662.85261
2011	3	659	148781.7742	664.16732
2011	3	660	148789.1935	664.82571
2011	3	661	148811.7742	666.83375
2011	3	662	148819.1935	667.49494
2011	3	663	148822.9032	667.82579

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	664	148831.4516	668.58884
2011	3	665	148835.1613	668.92027
2011	3	666	148838.871	669.25187
2011	3	667	148851.6129	670.39216
2011	3	668	148889.5161	673.79631
2011	3	669	148909.1935	675.57078
2011	3	670	148933.0645	677.73003
2011	3	671	148936.7742	678.06624
2011	3	672	148936.7742	678.06624
2011	3	673	148960.3226	680.20458
2011	3	674	148960.3226	680.20458
2011	3	675	148979.6774	681.96745
2011	3	676	148991.9355	683.08643
2011	3	677	148996.7742	683.52866
2011	3	678	148996.7742	683.52866
2011	3	679	149006.4516	684.41404
2011	3	680	149007.9355	684.54991
2011	3	681	149007.9355	684.54991
2011	3	682	149007.9355	684.54991
2011	3	683	149012.3871	684.95767
2011	3	684	149018.5806	685.52542
2011	3	685	149018.5806	685.52542
2011	3	686	149026.0645	686.21212
2011	3	687	149026.0645	686.21212
2011	3	688	149032	686.75726
2011	3	689	149033.4839	686.89361
2011	3	690	149033.4839	686.89361
2011	3	691	149039.6774	687.46306
2011	3	692	149042.7097	687.74203
2011	3	693	149042.7097	687.74203
2011	3	694	149044.2581	687.88453
2011	3	695	149045.7419	688.02112
2011	3	696	149045.7419	688.02112
2011	3	697	149045.7419	688.02112
2011	3	698	149045.7419	688.02112
2011	3	699	149045.7419	688.02112
2011	3	700	149045.7419	688.02112
2011	3	701	149045.7419	688.02112
2011	3	702	149045.7419	688.02112
2011	3	703	149045.7419	688.02112
2011	3	704	149045.7419	688.02112
2011	3	705	149045.7419	688.02112
2011	3	706	149045.7419	688.02112
2011	3	707	149045.7419	688.02112
2011	3	708	149045.7419	688.02112
2011	3	709	149045.7419	688.02112
2011	3	710	149045.7419	688.02112
2011	3	711	149045.7419	688.02112
2011	3	712	149045.7419	688.02112
2011	3	713	149045.7419	688.02112
2011	3	714	149045.7419	688.02112

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	715	149045.7419	688.02112
2011	3	716	149045.7419	688.02112
2011	3	717	149045.7419	688.02112
2011	3	718	149045.7419	688.02112
2011	3	719	149045.7419	688.02112
2011	3	720	149045.7419	688.02112
2011	3	721	149045.7419	688.02112
2011	3	722	149045.7419	688.02112
2011	3	723	149045.7419	688.02112
2011	3	724	149045.7419	688.02112
2011	3	725	149045.7419	688.02112
2011	3	726	149045.7419	688.02112
2011	3	727	149045.7419	688.02112
2011	3	728	149045.7419	688.02112
2011	3	729	149045.7419	688.02112
2011	3	730	149045.7419	688.02112
2011	3	731	149045.7419	688.02112
2011	3	732	149045.7419	688.02112
2011	3	733	149045.7419	688.02112
2011	3	734	149045.7419	688.02112
2011	3	735	149045.7419	688.02112
2011	3	736	149045.7419	688.02112
2011	3	737	149045.7419	688.02112
2011	3	738	149045.7419	688.02112
2011	3	739	149045.7419	688.02112
2011	3	740	149045.7419	688.02112
2011	3	741	149045.7419	688.02112
2011	3	742	149045.7419	688.02112
2011	3	743	149045.7419	688.02112
2011	3	744	149045.7419	688.02112
2011	3	745	149045.7419	688.02112
2011	3	746	149045.7419	688.02112
2011	3	747	149045.7419	688.02112
2011	3	748	149046.0968	688.05379
2011	3	749	149047.871	688.21715
2011	3	750	149084.8387	691.63036
2011	3	751	149086.4194	691.77669
2011	3	752	149086.4194	691.77669
2011	3	753	149086.4194	691.77669
2011	3	754	149087.4839	691.87527
2011	3	755	149090.3226	692.1382
2011	3	756	149165.4839	699.13837
2011	3	757	149168.4839	699.41932
2011	3	758	149168.4839	699.41932
2011	3	759	149168.8387	699.45256
2011	3	760	149171.129	699.66714
2011	3	761	149171.129	699.66714
2011	3	762	149180.9677	700.58972
2011	3	763	149182.5484	700.73806
2011	3	764	149187.2903	701.18327
2011	3	765	149189.2258	701.36507

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	766	149195.3871	701.94414
2011	3	767	149195.3871	701.94414
2011	3	768	149195.3871	701.94414
2011	3	769	149196.9677	702.09278
2011	3	770	149198.9032	702.27484
2011	3	771	149205.2258	702.86989
2011	3	772	149206.8065	703.01873
2011	3	773	149211.5484	703.46547
2011	3	774	149211.5484	703.46547
2011	3	775	149211.5484	703.46547
2011	3	776	149213.129	703.61445
2011	3	777	149213.129	703.61445
2011	3	778	149213.129	703.61445
2011	3	779	149214.7097	703.76346
2011	3	780	149214.7097	703.76346
2011	3	781	149214.7097	703.76346
2011	3	782	149214.7097	703.76346
2011	3	783	149214.7097	703.76346
2011	3	784	149214.7097	703.76346
2011	3	785	149214.7097	703.76346
2011	3	786	149214.7097	703.76346
2011	3	787	149214.7097	703.76346
2011	3	788	149214.7097	703.76346
2011	3	789	149214.7097	703.76346
2011	3	790	149214.7097	703.76346
2011	3	791	149214.7097	703.76346
2011	3	792	149214.7097	703.76346
2011	3	793	149242.7097	706.40862
2011	3	794	149242.7097	706.40862
2011	3	795	149242.7097	706.40862
2011	3	796	149242.7097	706.40862
2011	3	797	149242.7097	706.40862
2011	3	798	149242.7097	706.40862
2011	3	799	149242.7097	706.40862
2011	3	800	149242.7097	706.40862
2011	3	801	149242.7097	706.40862
2011	3	802	149242.7097	706.40862
2011	3	803	149242.7097	706.40862
2011	3	804	149242.7097	706.40862
2011	3	805	149242.7097	706.40862
2011	3	806	149242.7097	706.40862
2011	3	807	149242.7097	706.40862
2011	3	808	149242.7097	706.40862
2011	3	809	149242.7097	706.40862
2011	3	810	149242.7097	706.40862
2011	3	811	149242.7097	706.40862
2011	3	812	149242.7097	706.40862
2011	3	813	149242.7097	706.40862
2011	3	814	149242.7097	706.40862
2011	3	815	149242.7097	706.40862
2011	3	816	149242.7097	706.40862

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	817	149242.7097	706.40862
2011	3	818	149242.7097	706.40862
2011	3	819	149242.7097	706.40862
2011	3	820	149314.7097	713.25868
2011	3	821	149314.7097	713.25868
2011	3	822	149314.7097	713.25868
2011	3	823	149314.7097	713.25868
2011	3	824	149314.7097	713.25868
2011	3	825	149314.7097	713.25868
2011	3	826	149314.7097	713.25868
2011	3	827	149314.7097	713.25868
2011	3	828	149314.7097	713.25868
2011	3	829	149314.7097	713.25868
2011	3	830	149314.7097	713.25868
2011	3	831	149314.7097	713.25868
2011	3	832	149314.7097	713.25868
2011	3	833	149314.7097	713.25868
2011	3	834	149314.7097	713.25868
2011	3	835	149314.7097	713.25868
2011	3	836	149314.7097	713.25868
2011	3	837	149314.7097	713.25868
2011	3	838	149314.7097	713.25868
2011	3	839	149314.7097	713.25868
2011	3	840	149314.7097	713.25868
2011	3	841	149314.7097	713.25868
2011	3	842	149314.7097	713.25868
2011	3	843	149314.7097	713.25868
2011	3	844	149314.7097	713.25868
2011	3	845	149314.7097	713.25868
2011	3	846	149314.7097	713.25868
2011	3	847	149314.7097	713.25868
2011	3	848	149314.7097	713.25868
2011	3	849	149314.7097	713.25868
2011	3	850	149314.7097	713.25868
2011	3	851	149314.7097	713.25868
2011	3	852	149314.7097	713.25868
2011	3	853	149314.7097	713.25868
2011	3	854	149314.7097	713.25868
2011	3	855	149314.7097	713.25868
2011	3	856	149314.7097	713.25868
2011	3	857	149314.7097	713.25868
2011	3	858	149314.7097	713.25868
2011	3	859	149314.7097	713.25868
2011	3	860	149314.7097	713.25868
2011	3	861	149314.7097	713.25868
2011	3	862	149314.7097	713.25868
2011	3	863	149314.7097	713.25868
2011	3	864	149314.7097	713.25868
2011	3	865	149314.7097	713.25868
2011	3	866	149314.7097	713.25868
2011	3	867	149314.7097	713.25868

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	868	149314.7097	713.25868
2011	3	869	149314.7097	713.25868
2011	3	870	149314.7097	713.25868
2011	3	871	149314.7097	713.25868
2011	3	872	149314.7097	713.25868
2011	3	873	149314.7097	713.25868
2011	3	874	149314.7097	713.25868
2011	3	875	149314.7097	713.25868
2011	3	876	149314.7097	713.25868
2011	3	877	149314.7097	713.25868
2011	3	878	149314.7097	713.25868
2011	3	879	149314.7097	713.25868
2011	3	880	149314.7097	713.25868
2011	3	881	149314.7097	713.25868
2011	3	882	149314.7097	713.25868
2011	3	883	149350.7097	716.70991
2011	3	884	149350.7097	716.70991
2011	3	885	149350.7097	716.70991
2011	3	886	149350.7097	716.70991
2011	3	887	149350.7097	716.70991
2011	3	888	149350.7097	716.70991
2011	3	889	149350.7097	716.70991
2011	3	890	149350.7097	716.70991
2011	3	891	149350.7097	716.70991
2011	3	892	149350.7097	716.70991
2011	3	893	149350.7097	716.70991
2011	3	894	149350.7097	716.70991
2011	3	895	149350.7097	716.70991
2011	3	896	149350.7097	716.70991
2011	3	897	149350.7097	716.70991
2011	3	898	149350.7097	716.70991
2011	3	899	149350.7097	716.70991
2011	3	900	149350.7097	716.70991
2011	3	901	149350.7097	716.70991
2011	3	902	149350.7097	716.70991
2011	3	903	149350.7097	716.70991
2011	3	904	149350.7097	716.70991
2011	3	905	149350.7097	716.70991
2011	3	906	149350.7097	716.70991
2011	3	907	149350.7097	716.70991
2011	3	908	149350.7097	716.70991
2011	3	909	149410.7097	722.50109
2011	3	910	149410.7097	722.50109
2011	3	911	149410.7097	722.50109
2011	3	912	149410.7097	722.50109
2011	3	913	149410.7097	722.50109
2011	3	914	149410.7097	722.50109
2011	3	915	149410.7097	722.50109
2011	3	916	149410.7097	722.50109
2011	3	917	149410.7097	722.50109
2011	3	918	149410.7097	722.50109

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	919	149410.7097	722.50109
2011	3	920	149410.7097	722.50109
2011	3	921	149410.7097	722.50109
2011	3	922	149410.7097	722.50109
2011	3	923	149410.7097	722.50109
2011	3	924	149410.7097	722.50109
2011	3	925	149411.0968	722.53861
2011	3	926	149411.0968	722.53861
2011	3	927	149411.2903	722.55738
2011	3	928	149411.2903	722.55738
2011	3	929	149411.2903	722.55738
2011	3	930	149411.2903	722.55738
2011	3	931	149412.6452	722.68872
2011	3	932	149412.6452	722.68872
2011	3	933	149412.6452	722.68872
2011	3	934	149412.8387	722.70749
2011	3	935	149413.8065	722.80132
2011	3	936	149414.3871	722.85763
2011	3	937	149632.2581	744.31496
2011	3	938	150161.2258	799.24209
2011	3	939	150162	799.32553
2011	3	940	150162	799.32553
2011	3	941	150162.1935	799.34639
2011	3	942	150162.1935	799.34639
2011	3	943	150162.1935	799.34639
2011	3	944	150162.1935	799.34639
2011	3	945	150162.1935	799.34639
2011	3	946	150198.1935	803.23631
2011	3	947	150198.1935	803.23631
2011	3	948	150198.1935	803.23631
2011	3	949	150198.1935	803.23631
2011	3	950	150198.1935	803.23631
2011	3	951	150198.1935	803.23631
2011	3	952	150198.1935	803.23631
2011	3	953	150198.1935	803.23631
2011	3	954	150198.1935	803.23631
2011	3	955	150198.1935	803.23631
2011	3	956	150198.1935	803.23631
2011	3	957	150198.1935	803.23631
2011	3	958	150198.1935	803.23631
2011	3	959	150198.1935	803.23631
2011	3	960	150198.1935	803.23631
2011	3	961	150198.1935	803.23631
2011	3	962	150198.1935	803.23631
2011	3	963	150198.1935	803.23631
2011	3	964	150198.1935	803.23631
2011	3	965	150198.1935	803.23631
2011	3	966	150198.1935	803.23631
2011	3	967	150198.1935	803.23631
2011	3	968	150198.1935	803.23631
2011	3	969	150198.1935	803.23631

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	3	970	150198.1935	803.23631
2011	3	971	150198.1935	803.23631
2011	3	972	150198.1935	803.23631
2011	3	973	150198.1935	803.23631
2011	3	974	150198.1935	803.23631
2011	3	975	150198.1935	803.23631
2011	3	976	150198.1935	803.23631
2011	3	977	150198.1935	803.23631
2011	3	978	150198.1935	803.23631
2011	3	979	150198.1935	803.23631
2011	3	980	150198.1935	803.23631
2011	3	981	150203.1935	803.77814
2011	3	982	150203.1935	803.77814
2011	3	983	150203.1935	803.77814
2011	3	984	150203.1935	803.77814
2011	3	985	150204.7419	803.94601
2011	3	986	150204.7419	803.94601
2011	3	987	150204.7419	803.94601
2011	3	988	150207.8387	804.28186
2011	3	989	150209.3871	804.44984
2011	3	990	150209.3871	804.44984
2011	3	991	150210.9355	804.61786
2011	3	992	150221.7742	805.79501
2011	3	993	150226.4194	806.30006
2011	3	994	150231.129	806.81246
2011	3	995	150235.7742	807.31817
2011	3	996	150237.3226	807.48682
2011	3	997	150243.5161	808.16176
2011	3	998	150313.0968	815.78508
2011	3	999	150318.6452	816.3962

April 2011

Net Benefit Tab

Effective_month	Test_result
4/1/2011 0:00	\$36.76

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.976398395	1.362494508

Curve Parameters Tab

a	b	c	d
2.240109638	0.000183111	17.5388862	34.31118406

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	1	19839.5	34.31119
2011	4	2	20572.43333	34.31119
2011	4	3	20573.56667	34.31119
2011	4	4	21810.73333	34.3112
2011	4	5	25486.6	34.31121
2011	4	6	28135.96667	34.31123
2011	4	7	29204.73333	34.31123
2011	4	8	29356.83333	34.31123
2011	4	9	31109	34.31125
2011	4	10	31116.3	34.31125
2011	4	11	31116.66667	34.31125
2011	4	12	31158.2	34.31125
2011	4	13	31206.83333	34.31125
2011	4	14	31517.63333	34.31126
2011	4	15	33447.36667	34.31128
2011	4	16	33470.7	34.31128
2011	4	17	33526.33333	34.31128
2011	4	18	34335.66667	34.31129
2011	4	19	35577.56667	34.31132
2011	4	20	37295.23333	34.31136
2011	4	21	38071.46667	34.31138
2011	4	22	38791.56667	34.3114
2011	4	23	40558.1	34.31147
2011	4	24	42446.66667	34.31156
2011	4	25	46116.9	34.31183
2011	4	26	50011.36667	34.31233
2011	4	27	53168.1	34.31302
2011	4	28	58044.63333	34.31496
2011	4	29	63618.26667	34.31978
2011	4	30	68881.56667	34.32988
2011	4	31	71534.56667	34.33885
2011	4	32	73818.53333	34.34994
2011	4	33	76001.73333	34.36468
2011	4	34	78445.03333	34.3879
2011	4	35	80641.36667	34.41728
2011	4	36	82798.33333	34.45705
2011	4	37	84903.06667	34.5102
2011	4	38	85961.56667	34.54385
2011	4	39	87257.76667	34.59291
2011	4	40	88399.23333	34.6446
2011	4	41	89625.16667	34.71073
2011	4	42	90547.63333	34.76901
2011	4	43	91549.46667	34.84197
2011	4	44	92906.7	34.95969
2011	4	45	94168.76667	35.09248
2011	4	46	95260.86667	35.22913
2011	4	47	96243.83333	35.37245
2011	4	48	97633.46667	35.61405
2011	4	49	98980.43333	35.9006
2011	4	50	100065.1667	36.17657
2011	4	51	101000.1333	36.4526

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	52	101720.0667	36.69267
2011	4	53	102593.0333	37.02016
2011	4	54	103312.3333	37.32357
2011	4	55	104166.8333	37.72849
2011	4	56	104626.2667	37.96826
2011	4	57	105220.6333	38.30356
2011	4	58	106338.4667	39.0197
2011	4	59	107206.5667	39.66334
2011	4	60	107852.5667	40.19877
2011	4	61	108559.2667	40.84604
2011	4	62	109352.6	41.65782
2011	4	63	110154.8667	42.58133
2011	4	64	110786.1	43.38886
2011	4	65	111155.7333	43.89786
2011	4	66	112063.7	45.27263
2011	4	67	112651.6	46.26625
2011	4	68	113038.9	46.96955
2011	4	69	113306.5667	47.47964
2011	4	70	113639.5333	48.14295
2011	4	71	113917.2	48.72158
2011	4	72	114262.6333	49.47533
2011	4	73	114495.9333	50.00659
2011	4	74	115152.2333	51.60301
2011	4	75	115467.6333	52.42699
2011	4	76	115758.4333	53.22146
2011	4	77	116029.4	53.99306
2011	4	78	116254.7	54.65855
2011	4	79	116443.6	55.23383
2011	4	80	116773.7	56.27843
2011	4	81	117080.6667	57.29658
2011	4	82	117414.1667	58.45629
2011	4	83	117647.4333	59.30205
2011	4	84	117823.2333	59.95898
2011	4	85	117946.0667	60.4282
2011	4	86	118108.3333	61.06124
2011	4	87	118258.8333	61.66209
2011	4	88	118388.5333	62.19071
2011	4	89	118518.2667	62.72969
2011	4	90	118665.8667	63.35557
2011	4	91	118791.8667	63.90076
2011	4	92	118899.8333	64.37605
2011	4	93	119020.4	64.91585
2011	4	94	119126.4667	65.39873
2011	4	95	119182.9667	65.65905
2011	4	96	119216.6667	65.81536
2011	4	97	119250.9	65.97494
2011	4	98	119281.9	66.12015
2011	4	99	119321.3	66.30566
2011	4	100	119364.7667	66.51158
2011	4	101	119380.0333	66.58422
2011	4	102	119461.0667	66.97252

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	103	119640.6667	67.84989
2011	4	104	119963.1667	69.4849
2011	4	105	120081.7	70.10567
2011	4	106	120131.0333	70.36725
2011	4	107	120233.1	70.91453
2011	4	108	120300	71.27774
2011	4	109	120437.3	72.0345
2011	4	110	120518.3333	72.48838
2011	4	111	120592.4667	72.9084
2011	4	112	120695.6333	73.50061
2011	4	113	120768.6667	73.92533
2011	4	114	120902.3	74.71441
2011	4	115	120923	74.83804
2011	4	116	120923.5	74.84103
2011	4	117	120976.2667	75.15791
2011	4	118	121046.1	75.58109
2011	4	119	121051.4	75.61339
2011	4	120	121057.8333	75.65263
2011	4	121	121060.5333	75.6691
2011	4	122	121065.4	75.69882
2011	4	123	121073.5	75.74833
2011	4	124	121081.6	75.7979
2011	4	125	121177.8333	76.39136
2011	4	126	121187.8333	76.45351
2011	4	127	121204.9	76.5598
2011	4	128	121288.8	77.08622
2011	4	129	121290.7	77.09822
2011	4	130	121317.9333	77.27055
2011	4	131	121571.7	78.91008
2011	4	132	121696.9667	79.74232
2011	4	133	121816.1	80.54822
2011	4	134	121933.4	81.35568
2011	4	135	122050.4	82.17512
2011	4	136	122212.7333	83.33577
2011	4	137	122373.7333	84.51467
2011	4	138	122641.6	86.53925
2011	4	139	122791.2667	87.7058
2011	4	140	123062.1333	89.88367
2011	4	141	123221.8	91.20884
2011	4	142	123358.9333	92.37218
2011	4	143	123499.1333	93.58614
2011	4	144	123686	95.24372
2011	4	145	123876.0667	96.97724
2011	4	146	124030.9	98.42581
2011	4	147	124641.2333	104.46948
2011	4	148	124736.4333	105.46223
2011	4	149	124858.9667	106.76072
2011	4	150	124983.3667	108.10323
2011	4	151	125146.3333	109.89966
2011	4	152	125285.8	111.47173
2011	4	153	125479.1	113.70482

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	154	125641.2333	115.62762
2011	4	155	125810.8667	117.68923
2011	4	156	125979.9	119.79554
2011	4	157	126139.8667	121.83785
2011	4	158	126312.2	124.09268
2011	4	159	126467.4	126.173
2011	4	160	126557.1333	127.39772
2011	4	161	126672.8667	129.00144
2011	4	162	126802.9333	130.83678
2011	4	163	126910.8333	132.38629
2011	4	164	127084.5667	134.93366
2011	4	165	127213	136.85925
2011	4	166	127328.6667	138.62495
2011	4	167	127452.7	140.55216
2011	4	168	127570.9333	142.4224
2011	4	169	127647.6	143.65268
2011	4	170	127717.7667	144.79093
2011	4	171	127792.7333	146.02013
2011	4	172	127964.7667	148.89286
2011	4	173	128055.2	150.43248
2011	4	174	128145.6333	151.99279
2011	4	175	128209.1667	153.1015
2011	4	176	128298.7667	154.68287
2011	4	177	128408.4667	156.64768
2011	4	178	128486.1333	158.05811
2011	4	179	128560.0333	159.41523
2011	4	180	128656.0333	161.20045
2011	4	181	128806.2667	164.04546
2011	4	182	128903.7667	165.92589
2011	4	183	128952.5	166.87597
2011	4	184	129049.0667	168.7789
2011	4	185	129140	170.59579
2011	4	186	129217.5333	172.16431
2011	4	187	129287.4333	173.59388
2011	4	188	129416.1333	176.2649
2011	4	189	129498.4333	177.99972
2011	4	190	129616.8	180.53205
2011	4	191	129766.4	183.79652
2011	4	192	129883.1	186.39359
2011	4	193	130030.7667	189.74457
2011	4	194	130072.3333	190.70109
2011	4	195	130129.8333	192.03396
2011	4	196	130182.8667	193.27337
2011	4	197	130233.8	194.47286
2011	4	198	130306.2667	196.19509
2011	4	199	130346.9667	197.17046
2011	4	200	130373.9	197.81915
2011	4	201	130432.9667	199.25083
2011	4	202	130482.5	200.46109
2011	4	203	130542.8667	201.94806
2011	4	204	130593.3333	203.20138

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	205	130620.8333	203.88827
2011	4	206	130651.2667	204.65169
2011	4	207	130671.8333	205.16954
2011	4	208	130687.5	205.56508
2011	4	209	130753	207.22869
2011	4	210	130824.7667	209.07002
2011	4	211	130892.3667	210.82238
2011	4	212	130942.3667	212.1298
2011	4	213	131092.5667	216.11582
2011	4	214	131188.6667	218.71287
2011	4	215	131315.5667	222.1992
2011	4	216	131948.3667	240.59308
2011	4	217	131966.2	241.13675
2011	4	218	131969.4333	241.23547
2011	4	219	131974.7667	241.39842
2011	4	220	132024.4	242.92103
2011	4	221	132688.4333	264.40178
2011	4	222	132700.3	264.80512
2011	4	223	132703.4333	264.91174
2011	4	224	132714.6	265.29212
2011	4	225	132725.2333	265.65491
2011	4	226	132726.4667	265.69702
2011	4	227	133156.0667	280.84349
2011	4	228	133163.0667	281.09832
2011	4	229	133163.1333	281.10075
2011	4	230	133207.1667	282.70988
2011	4	231	133207.2	282.7111
2011	4	232	133207.2333	282.71232
2011	4	233	133207.2667	282.71354
2011	4	234	133231	283.5852
2011	4	235	133236.7	283.79499
2011	4	236	133236.7333	283.79622
2011	4	237	133242.1	283.99391
2011	4	238	133247.4667	284.19176
2011	4	239	133247.5	284.19299
2011	4	240	133253.2	284.4033
2011	4	241	133257.5667	284.56454
2011	4	242	133257.6	284.56577
2011	4	243	133267.0667	284.91568
2011	4	244	133282.3	285.47976
2011	4	245	133312.7667	286.61173
2011	4	246	133328.4333	287.1958
2011	4	247	133353.4333	288.13063
2011	4	248	133402.1667	289.96287
2011	4	249	133425.1	290.82967
2011	4	250	133445.2333	291.59307
2011	4	251	133465.9	292.37905
2011	4	252	133476.5333	292.78438
2011	4	253	133522.7667	294.55417
2011	4	254	133547.4	295.50207
2011	4	255	133579.4333	296.73989

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	256	133594.3667	297.31894
2011	4	257	133628.2667	298.63818
2011	4	258	133640.4333	299.11326
2011	4	259	133645.3	299.30354
2011	4	260	133655.4667	299.70147
2011	4	261	133696.3667	301.30837
2011	4	262	133729.5333	302.61858
2011	4	263	133757.4333	303.72571
2011	4	264	133794	305.18368
2011	4	265	133825.5667	306.44863
2011	4	266	133854.7667	307.624
2011	4	267	133860.8667	307.87019
2011	4	268	133861.9333	307.91326
2011	4	269	133881.6333	308.70994
2011	4	270	133929.6667	310.66218
2011	4	271	133948.2333	311.42052
2011	4	272	133967.7	312.21784
2011	4	273	133979.5333	312.70364
2011	4	274	133983.5	312.86667
2011	4	275	134034.0667	314.9534
2011	4	276	134069	316.40412
2011	4	277	134083.8667	317.02378
2011	4	278	134134.5667	319.14725
2011	4	279	134182.2667	321.15964
2011	4	280	134217.1	322.63818
2011	4	281	134226.1333	323.02286
2011	4	282	134236.9	323.48201
2011	4	283	134247.7	323.94332
2011	4	284	134263.5	324.61953
2011	4	285	134268.2333	324.82241
2011	4	286	134274.2667	325.08122
2011	4	287	134306.1	326.4506
2011	4	288	134314.4	326.8087
2011	4	289	134319.8667	327.04479
2011	4	290	134324.7667	327.25658
2011	4	291	134324.7667	327.25658
2011	4	292	134334.9667	327.69793
2011	4	293	134361.3667	328.84333
2011	4	294	134408.9333	330.91839
2011	4	295	134474.4	333.79824
2011	4	296	134474.4333	333.79972
2011	4	297	134481.2333	334.10045
2011	4	298	134491.5	334.55506
2011	4	299	134496.3	334.76784
2011	4	300	134498.5	334.86542
2011	4	301	134498.5	334.86542
2011	4	302	134500.8	334.96747
2011	4	303	134500.8	334.96747
2011	4	304	134501.5333	335.00001
2011	4	305	134503.0667	335.06807
2011	4	306	134503.0667	335.06807

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	307	134505.2667	335.16574
2011	4	308	134509.9667	335.37451
2011	4	309	134513.8667	335.54786
2011	4	310	134515.3667	335.61456
2011	4	311	134520.1	335.82513
2011	4	312	134520.1	335.82513
2011	4	313	134520.9	335.86073
2011	4	314	134520.9333	335.86221
2011	4	315	134520.9333	335.86221
2011	4	316	134520.9333	335.86221
2011	4	317	134520.9333	335.86221
2011	4	318	134520.9333	335.86221
2011	4	319	134527.1667	336.13977
2011	4	320	134527.1667	336.13977
2011	4	321	134527.2	336.14125
2011	4	322	134527.2333	336.14274
2011	4	323	134527.2333	336.14274
2011	4	324	134527.2333	336.14274
2011	4	325	134527.2333	336.14274
2011	4	326	134527.2333	336.14274
2011	4	327	134594.2333	339.1423
2011	4	328	134594.2333	339.1423
2011	4	329	134594.2333	339.1423
2011	4	330	134594.2333	339.1423
2011	4	331	134609.7333	339.84046
2011	4	332	134609.7333	339.84046
2011	4	333	134636.1667	341.03478
2011	4	334	134681.6	343.09849
2011	4	335	134681.6	343.09849
2011	4	336	134682.0667	343.11976
2011	4	337	134685.6	343.28084
2011	4	338	134693.4	343.63674
2011	4	339	134708.0333	344.30554
2011	4	340	134771.1	347.20453
2011	4	341	134775.4333	347.40471
2011	4	342	134777.8	347.51409
2011	4	343	134809.4333	348.97982
2011	4	344	134833.4667	350.09799
2011	4	345	134866.2333	351.62889
2011	4	346	134899.2667	353.17975
2011	4	347	134927.1333	354.49395
2011	4	348	134944.0667	355.29517
2011	4	349	134953.4333	355.73922
2011	4	350	135007.3667	358.30808
2011	4	351	135026.0667	359.20355
2011	4	352	135033.8333	359.57619
2011	4	353	135037.3333	359.74426
2011	4	354	135037.9333	359.77308
2011	4	355	135038.6333	359.80671
2011	4	356	135045.9667	360.1592
2011	4	357	135045.9667	360.1592

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	358	135045.9667	360.1592
2011	4	359	135047.6	360.23776
2011	4	360	135094.4	362.49686
2011	4	361	135096.1333	362.58083
2011	4	362	135097.7667	362.65998
2011	4	363	135097.7667	362.65998
2011	4	364	135106.1667	363.06731
2011	4	365	135114.9667	363.49459
2011	4	366	135135.7667	364.50672
2011	4	367	135153.2333	365.35905
2011	4	368	135158.9333	365.63768
2011	4	369	135171.7667	366.26584
2011	4	370	135187.2333	367.02449
2011	4	371	135195.1667	367.4143
2011	4	372	135211.1	368.19857
2011	4	373	135273.6	371.2928
2011	4	374	135301.0667	372.66167
2011	4	375	135340.8	374.65173
2011	4	376	135393.0333	377.28566
2011	4	377	135415.2667	378.41299
2011	4	378	135451.1333	380.23939
2011	4	379	135549.4	385.29315
2011	4	380	135581.5667	386.96343
2011	4	381	135607.8	388.33151
2011	4	382	135652.4667	390.67311
2011	4	383	135707.4667	393.57771
2011	4	384	135721.1	394.30136
2011	4	385	135736.8667	395.14006
2011	4	386	135790.3333	397.99875
2011	4	387	135802.1	398.63091
2011	4	388	135813.7667	399.25879
2011	4	389	135841.4333	400.75207
2011	4	390	135849.4333	401.18501
2011	4	391	135860.2	401.76847
2011	4	392	135863.7	401.95834
2011	4	393	135885.2333	403.12865
2011	4	394	135895.3667	403.68067
2011	4	395	135928.0667	405.46768
2011	4	396	135945.2667	406.4111
2011	4	397	135972.5333	407.9116
2011	4	398	136005.7	409.74493
2011	4	399	136026.0333	410.87333
2011	4	400	136064.7667	413.03223
2011	4	401	136109.3667	415.53346
2011	4	402	136135.4333	417.00295
2011	4	403	136173.1667	419.14019
2011	4	404	136219.5	421.78087
2011	4	405	136247.9	423.40843
2011	4	406	136355.7667	429.65262
2011	4	407	136389.6667	431.63564
2011	4	408	136455.7667	435.53089

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	409	136472.1667	436.50324
2011	4	410	136487.3333	437.40456
2011	4	411	136509	438.69566
2011	4	412	136532.6333	440.10868
2011	4	413	136544.9333	440.84603
2011	4	414	136575.2	442.66616
2011	4	415	136588.1333	443.44641
2011	4	416	136595.5667	443.89552
2011	4	417	136613.4667	444.97905
2011	4	418	136619.1667	445.32468
2011	4	419	136745.5333	453.06242
2011	4	420	136754.3	453.60459
2011	4	421	136760.3	453.97607
2011	4	422	136773.1667	454.77379
2011	4	423	136780.8333	455.24983
2011	4	424	136796.4667	456.22222
2011	4	425	136802.8667	456.62095
2011	4	426	136809.8667	457.05749
2011	4	427	136815.2667	457.39455
2011	4	428	136828.2667	458.20711
2011	4	429	136846.5333	459.3515
2011	4	430	136864.7667	460.49688
2011	4	431	136881.2333	461.53393
2011	4	432	136889.6333	462.06393
2011	4	433	136899.1667	462.66623
2011	4	434	137042.4	471.81822
2011	4	435	137087.7333	474.75536
2011	4	436	137118.7333	476.7752
2011	4	437	137158.2667	479.36447
2011	4	438	137227.3333	483.92447
2011	4	439	137256.6667	485.87526
2011	4	440	137288.7	488.01528
2011	4	441	137303.1333	488.98282
2011	4	442	137317.8	489.96812
2011	4	443	137352.2	492.28748
2011	4	444	137385.4333	494.53939
2011	4	445	137404.9	495.8636
2011	4	446	137416.7667	496.6727
2011	4	447	137436.0667	497.99164
2011	4	448	137450	498.94617
2011	4	449	137465.6667	500.0218
2011	4	450	137479.1333	500.94836
2011	4	451	137494.0667	501.978
2011	4	452	137500.4	502.41536
2011	4	453	137506.0667	502.80703
2011	4	454	137515.2667	503.44362
2011	4	455	137522.3	503.93087
2011	4	456	137531.9667	504.60137
2011	4	457	137543.4667	505.40029
2011	4	458	137575.2667	507.61654
2011	4	459	137583.6	508.19904

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	460	137602.4	509.51579
2011	4	461	137613.1333	510.2692
2011	4	462	137628.6667	511.36164
2011	4	463	137637.0667	511.95345
2011	4	464	137643.7667	512.42602
2011	4	465	137655.5	513.25472
2011	4	466	137669.3	514.23122
2011	4	467	137679.1333	514.92826
2011	4	468	137693.1667	515.92476
2011	4	469	137718.4333	517.72415
2011	4	470	137734.3333	518.85993
2011	4	471	137743.2667	519.49923
2011	4	472	137748.4	519.86698
2011	4	473	137755.9333	520.40715
2011	4	474	137813.2	524.53316
2011	4	475	137848.8667	527.12058
2011	4	476	137899.9333	530.84899
2011	4	477	137948.9	534.45056
2011	4	478	137957.7	535.10058
2011	4	479	137976.9333	536.5242
2011	4	480	137990.0333	537.49616
2011	4	481	138197	553.10415
2011	4	482	138217.1	554.64551
2011	4	483	138221.7667	555.00403
2011	4	484	138244.2667	556.73605
2011	4	485	138246.0667	556.87486
2011	4	486	138246.1	556.87743
2011	4	487	138253.7667	557.46908
2011	4	488	138258.9333	557.86818
2011	4	489	138312.1667	561.99793
2011	4	490	138315.1333	562.22903
2011	4	491	138325.8667	563.06601
2011	4	492	138327.4667	563.19089
2011	4	493	138336.1	563.86523
2011	4	494	138342.4	564.35786
2011	4	495	138342.8667	564.39437
2011	4	496	138351.1667	565.04414
2011	4	497	138385.0667	567.70628
2011	4	498	138386.6667	567.83226
2011	4	499	138394.4333	568.44419
2011	4	500	138400.1	568.89111
2011	4	501	138401.7	569.01737
2011	4	502	138417.2	570.24202
2011	4	503	138421.0333	570.54532
2011	4	504	138431.9333	571.4087
2011	4	505	138434.7667	571.63335
2011	4	506	138447.8667	572.67326
2011	4	507	138463.5	573.9169
2011	4	508	138482.1667	575.40561
2011	4	509	138492.4333	576.22615
2011	4	510	138524.7667	578.81847

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	511	138598.5667	584.7819
2011	4	512	138605.2333	585.32381
2011	4	513	138607.8	585.53258
2011	4	514	138607.8	585.53258
2011	4	515	138610.4	585.74415
2011	4	516	138614.8667	586.10781
2011	4	517	138616.9	586.27343
2011	4	518	138621.9	586.68091
2011	4	519	138636.2667	587.85342
2011	4	520	138643.8667	588.47468
2011	4	521	138657.1333	589.56084
2011	4	522	138667.4333	590.40559
2011	4	523	138668.9333	590.52872
2011	4	524	138709.9333	593.90479
2011	4	525	138710.8	593.97638
2011	4	526	138711.3667	594.02319
2011	4	527	138731.6333	595.69993
2011	4	528	138734.0667	595.90158
2011	4	529	138734.6	595.94579
2011	4	530	138735.7333	596.03974
2011	4	531	138735.7667	596.04251
2011	4	532	138736.2	596.07844
2011	4	533	138737.4	596.17794
2011	4	534	138737.4	596.17794
2011	4	535	138737.4	596.17794
2011	4	536	138737.4	596.17794
2011	4	537	138809.8	602.21414
2011	4	538	138812.8	602.46565
2011	4	539	138826.3333	603.60164
2011	4	540	138837.6333	604.5519
2011	4	541	138855.4667	606.0548
2011	4	542	138884.5667	608.51572
2011	4	543	138899.1667	609.75439
2011	4	544	138901.9667	609.99225
2011	4	545	138931.9667	612.54691
2011	4	546	138932.4667	612.58959
2011	4	547	138932.9667	612.63226
2011	4	548	138932.9667	612.63226
2011	4	549	138932.9667	612.63226
2011	4	550	138932.9667	612.63226
2011	4	551	138932.9667	612.63226
2011	4	552	138933	612.63511
2011	4	553	138933.0333	612.63795
2011	4	554	138933.0333	612.63795
2011	4	555	138933.0333	612.63795
2011	4	556	138933.0333	612.63795
2011	4	557	138933.0333	612.63795
2011	4	558	138933.0333	612.63795
2011	4	559	138933.0333	612.63795
2011	4	560	138933.0333	612.63795
2011	4	561	138933.0333	612.63795

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	562	138938.4333	613.09907
2011	4	563	138974.2333	616.1654
2011	4	564	138979.3333	616.60355
2011	4	565	139000.7333	618.44563
2011	4	566	139000.7333	618.44563
2011	4	567	139000.7333	618.44563
2011	4	568	139052	622.88234
2011	4	569	139084.4333	625.70657
2011	4	570	139100.4	627.10188
2011	4	571	139122	628.99473
2011	4	572	139173.3333	633.51746
2011	4	573	139236.1667	639.10025
2011	4	574	139272.9	642.38809
2011	4	575	139278	642.84598
2011	4	576	139306.2667	645.39008
2011	4	577	139306.2667	645.39008
2011	4	578	139311.3667	645.85023
2011	4	579	139326.7667	647.24181
2011	4	580	139326.8	647.24483
2011	4	581	139326.8	647.24483
2011	4	582	139326.8	647.24483
2011	4	583	139326.8	647.24483
2011	4	584	139326.8	647.24483
2011	4	585	139326.8	647.24483
2011	4	586	139326.8	647.24483
2011	4	587	139337.8	648.24075
2011	4	588	139337.8	648.24075
2011	4	589	139358.9667	650.16172
2011	4	590	139359.5333	650.21322
2011	4	591	139360.1333	650.26777
2011	4	592	139361.5	650.39203
2011	4	593	139367.0333	650.89538
2011	4	594	139376.2333	651.73319
2011	4	595	139386.7667	652.69381
2011	4	596	139398.3333	653.7504
2011	4	597	139411.3333	654.94007
2011	4	598	139424.3	656.12897
2011	4	599	139433.8	657.00146
2011	4	600	139444.8333	658.01631
2011	4	601	139457.4	659.17421
2011	4	602	139469.9	660.3281
2011	4	603	139481.3	661.3823
2011	4	604	139491.9667	662.3703
2011	4	605	139502.7667	663.37224
2011	4	606	139512.6333	664.28898
2011	4	607	139519.5	664.92778
2011	4	608	139523.8667	665.33434
2011	4	609	139527.1333	665.63865
2011	4	610	139529.7667	665.88407
2011	4	611	139531.6667	666.06121
2011	4	612	139534.4	666.31612

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	613	139535.5	666.41874
2011	4	614	139536.4667	666.50893
2011	4	615	139536.4667	666.50893
2011	4	616	139536.4667	666.50893
2011	4	617	139536.4667	666.50893
2011	4	618	139536.4667	666.50893
2011	4	619	139537.8667	666.63958
2011	4	620	139537.8667	666.63958
2011	4	621	139539.9667	666.8356
2011	4	622	139558.6333	668.58066
2011	4	623	139559.3333	668.64619
2011	4	624	139559.3333	668.64619
2011	4	625	139559.3333	668.64619
2011	4	626	139560.7333	668.77728
2011	4	627	139562.1333	668.9084
2011	4	628	139562.8333	668.97396
2011	4	629	139563.5333	669.03954
2011	4	630	139564.2333	669.10512
2011	4	631	139569.1333	669.56437
2011	4	632	139571.9333	669.82696
2011	4	633	139572.6333	669.89262
2011	4	634	139572.6333	669.89262
2011	4	635	139572.6333	669.89262
2011	4	636	139572.6333	669.89262
2011	4	637	139572.6333	669.89262
2011	4	638	139572.6333	669.89262
2011	4	639	139574.0333	670.02396
2011	4	640	139574.0333	670.02396
2011	4	641	139576.1333	670.22103
2011	4	642	139576.1333	670.22103
2011	4	643	139576.1333	670.22103
2011	4	644	139576.1333	670.22103
2011	4	645	139576.1333	670.22103
2011	4	646	139577.5333	670.35244
2011	4	647	139577.5333	670.35244
2011	4	648	139579.6333	670.54961
2011	4	649	139579.6333	670.54961
2011	4	650	139580.3333	670.61535
2011	4	651	139580.3333	670.61535
2011	4	652	139580.3333	670.61535
2011	4	653	139581.7333	670.74684
2011	4	654	139583.1333	670.87837
2011	4	655	139593.1333	671.81859
2011	4	656	139593.8333	671.88446
2011	4	657	139595.2333	672.01622
2011	4	658	139598.0333	672.27981
2011	4	659	139602.9333	672.74137
2011	4	660	139603.6333	672.80733
2011	4	661	139603.6333	672.80733
2011	4	662	139603.6333	672.80733
2011	4	663	139611.3	673.53023

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	664	139611.3	673.53023
2011	4	665	139615.1333	673.89199
2011	4	666	139617.5333	674.11859
2011	4	667	139617.5333	674.11859
2011	4	668	139618.2333	674.18469
2011	4	669	139618.9333	674.2508
2011	4	670	139626.6	674.97534
2011	4	671	139626.6	674.97534
2011	4	672	139640.5	676.29105
2011	4	673	139643.7	676.59433
2011	4	674	139650.7333	677.26141
2011	4	675	139653.9333	677.56515
2011	4	676	139653.9333	677.56515
2011	4	677	139669.7667	679.07013
2011	4	678	139680.7	680.11142
2011	4	679	139695.1333	681.48862
2011	4	680	139713.7667	683.27091
2011	4	681	139726.7667	684.51728
2011	4	682	139763.4333	688.0456
2011	4	683	139792.6667	690.87234
2011	4	684	139796.5	691.24391
2011	4	685	139801.3	691.70948
2011	4	686	139810.9	692.64161
2011	4	687	139846.9	696.14888
2011	4	688	139865	697.91931
2011	4	689	139868.2	698.23281
2011	4	690	139879.2	699.31159
2011	4	691	139890.9667	700.46749
2011	4	692	139895.4333	700.9068
2011	4	693	139900.8667	701.44158
2011	4	694	139907	702.04576
2011	4	695	139910.2	702.36121
2011	4	696	139913.4	702.67681
2011	4	697	139917.2333	703.05506
2011	4	698	139923.2333	703.64754
2011	4	699	139925.4	703.86162
2011	4	700	139929.2333	704.24054
2011	4	701	139929.2333	704.24054
2011	4	702	139929.2333	704.24054
2011	4	703	139929.2333	704.24054
2011	4	704	139929.2333	704.24054
2011	4	705	139941.9	705.49416
2011	4	706	139941.9	705.49416
2011	4	707	139958.0667	707.09759
2011	4	708	139958.0667	707.09759
2011	4	709	139961.9	707.47834
2011	4	710	139961.9	707.47834
2011	4	711	139966.5667	707.94216
2011	4	712	139975.4	708.82098
2011	4	713	139979.2333	709.20271
2011	4	714	139986.9	709.96682

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	715	139990.7333	710.3492
2011	4	716	139999.2333	711.19785
2011	4	717	140013.0667	712.58127
2011	4	718	140055.0667	716.7989
2011	4	719	140096.2333	720.95828
2011	4	720	140110.0667	722.36166
2011	4	721	140136.3333	725.03427
2011	4	722	140146.3333	726.05449
2011	4	723	140151.2	726.55154
2011	4	724	140156.2	727.06258
2011	4	725	140156.2	727.06258
2011	4	726	140156.2	727.06258
2011	4	727	140157.7333	727.21938
2011	4	728	140164.2667	727.88786
2011	4	729	140173.1	728.7927
2011	4	730	140176.9333	729.18573
2011	4	731	140176.9333	729.18573
2011	4	732	140178.4667	729.34301
2011	4	733	140182.2667	729.73293
2011	4	734	140190.7333	730.60249
2011	4	735	140190.7333	730.60249
2011	4	736	140198.5333	731.40455
2011	4	737	140206.4667	732.22126
2011	4	738	140209.6667	732.55096
2011	4	739	140210.7	732.65746
2011	4	740	140212.2333	732.81552
2011	4	741	140212.2333	732.81552
2011	4	742	140212.2333	732.81552
2011	4	743	140212.2333	732.81552
2011	4	744	140213.8333	732.98049
2011	4	745	140213.8333	732.98049
2011	4	746	140215.4333	733.14551
2011	4	747	140215.4333	733.14551
2011	4	748	140215.4333	733.14551
2011	4	749	140215.4333	733.14551
2011	4	750	140215.4333	733.14551
2011	4	751	140215.4333	733.14551
2011	4	752	140215.4333	733.14551
2011	4	753	140215.4333	733.14551
2011	4	754	140215.4333	733.14551
2011	4	755	140215.4333	733.14551
2011	4	756	140215.4333	733.14551
2011	4	757	140215.4333	733.14551
2011	4	758	140215.4333	733.14551
2011	4	759	140215.4333	733.14551
2011	4	760	140215.4333	733.14551
2011	4	761	140215.4333	733.14551
2011	4	762	140215.4333	733.14551
2011	4	763	140215.4333	733.14551
2011	4	764	140215.4333	733.14551
2011	4	765	140215.4333	733.14551

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	766	140215.4333	733.14551
2011	4	767	140215.4333	733.14551
2011	4	768	140215.4333	733.14551
2011	4	769	140215.4333	733.14551
2011	4	770	140215.4333	733.14551
2011	4	771	140215.4333	733.14551
2011	4	772	140215.4333	733.14551
2011	4	773	140215.4333	733.14551
2011	4	774	140215.4333	733.14551
2011	4	775	140215.4333	733.14551
2011	4	776	140215.4333	733.14551
2011	4	777	140215.4333	733.14551
2011	4	778	140215.4333	733.14551
2011	4	779	140215.4333	733.14551
2011	4	780	140215.4333	733.14551
2011	4	781	140215.4333	733.14551
2011	4	782	140215.4333	733.14551
2011	4	783	140215.4333	733.14551
2011	4	784	140290.4333	740.92426
2011	4	785	140346.9667	746.8449
2011	4	786	140346.9667	746.8449
2011	4	787	140346.9667	746.8449
2011	4	788	140346.9667	746.8449
2011	4	789	140346.9667	746.8449
2011	4	790	140346.9667	746.8449
2011	4	791	140346.9667	746.8449
2011	4	792	140346.9667	746.8449
2011	4	793	140374.9667	749.79563
2011	4	794	140374.9667	749.79563
2011	4	795	140374.9667	749.79563
2011	4	796	140374.9667	749.79563
2011	4	797	140375.3333	749.83436
2011	4	798	140375.3333	749.83436
2011	4	799	140375.3333	749.83436
2011	4	800	140375.3333	749.83436
2011	4	801	140375.7	749.87308
2011	4	802	140375.7	749.87308
2011	4	803	140377.7	750.08434
2011	4	804	140377.7	750.08434
2011	4	805	140378.0667	750.12307
2011	4	806	140378.0667	750.12307
2011	4	807	140378.0667	750.12307
2011	4	808	140378.0667	750.12307
2011	4	809	140378.0667	750.12307
2011	4	810	140380.4333	750.37315
2011	4	811	140380.4333	750.37315
2011	4	812	140381.9	750.52818
2011	4	813	140384.4667	750.79955
2011	4	814	140387.5667	751.12745
2011	4	815	140387.9333	751.16624
2011	4	816	140389.4	751.32144

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	817	140392.6667	751.66722
2011	4	818	140393.0333	751.70604
2011	4	819	140393.4	751.74487
2011	4	820	140396.5333	752.07673
2011	4	821	140399.8	752.42288
2011	4	822	140411.6	753.67464
2011	4	823	140411.6	753.67464
2011	4	824	140416.8667	754.23404
2011	4	825	140421.7667	754.75488
2011	4	826	140421.7667	754.75488
2011	4	827	140423.4	754.92858
2011	4	828	140425.0333	755.10232
2011	4	829	140426.6667	755.2761
2011	4	830	140426.6667	755.2761
2011	4	831	140429.9333	755.62379
2011	4	832	140429.9333	755.62379
2011	4	833	140431.5667	755.7977
2011	4	834	140431.5667	755.7977
2011	4	835	140433.2	755.97165
2011	4	836	140433.2	755.97165
2011	4	837	140433.2	755.97165
2011	4	838	140434.8333	756.14564
2011	4	839	140434.8333	756.14564
2011	4	840	140434.8333	756.14564
2011	4	841	140434.8333	756.14564
2011	4	842	140434.8333	756.14564
2011	4	843	140434.8333	756.14564
2011	4	844	140434.8333	756.14564
2011	4	845	140434.8333	756.14564
2011	4	846	140434.8333	756.14564
2011	4	847	140434.8333	756.14564
2011	4	848	140434.8333	756.14564
2011	4	849	140434.8333	756.14564
2011	4	850	140491.3667	762.19382
2011	4	851	140491.3667	762.19382
2011	4	852	140491.3667	762.19382
2011	4	853	140491.3667	762.19382
2011	4	854	140491.3667	762.19382
2011	4	855	140491.3667	762.19382
2011	4	856	140491.3667	762.19382
2011	4	857	140491.3667	762.19382
2011	4	858	140491.3667	762.19382
2011	4	859	140491.3667	762.19382
2011	4	860	140491.3667	762.19382
2011	4	861	140491.3667	762.19382
2011	4	862	140491.3667	762.19382
2011	4	863	140491.3667	762.19382
2011	4	864	140491.3667	762.19382
2011	4	865	140491.3667	762.19382
2011	4	866	140491.3667	762.19382
2011	4	867	140491.3667	762.19382

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	868	140491.3667	762.19382
2011	4	869	140491.3667	762.19382
2011	4	870	140491.3667	762.19382
2011	4	871	140491.3667	762.19382
2011	4	872	140491.3667	762.19382
2011	4	873	140491.3667	762.19382
2011	4	874	140491.3667	762.19382
2011	4	875	140491.3667	762.19382
2011	4	876	140491.3667	762.19382
2011	4	877	140491.3667	762.19382
2011	4	878	140491.3667	762.19382
2011	4	879	140491.3667	762.19382
2011	4	880	140491.3667	762.19382
2011	4	881	140491.3667	762.19382
2011	4	882	140491.3667	762.19382
2011	4	883	140491.3667	762.19382
2011	4	884	140491.3667	762.19382
2011	4	885	140491.3667	762.19382
2011	4	886	140491.3667	762.19382
2011	4	887	140491.3667	762.19382
2011	4	888	140491.3667	762.19382
2011	4	889	140491.3667	762.19382
2011	4	890	140491.3667	762.19382
2011	4	891	140491.3667	762.19382
2011	4	892	140491.3667	762.19382
2011	4	893	140491.3667	762.19382
2011	4	894	140491.3667	762.19382
2011	4	895	140491.3667	762.19382
2011	4	896	140491.3667	762.19382
2011	4	897	140491.3667	762.19382
2011	4	898	140491.3667	762.19382
2011	4	899	140491.3667	762.19382
2011	4	900	140491.3667	762.19382
2011	4	901	140491.3667	762.19382
2011	4	902	140491.3667	762.19382
2011	4	903	140491.3667	762.19382
2011	4	904	140491.3667	762.19382
2011	4	905	140491.3667	762.19382
2011	4	906	140491.3667	762.19382
2011	4	907	140491.3667	762.19382
2011	4	908	140491.3667	762.19382
2011	4	909	140491.3667	762.19382
2011	4	910	140491.3667	762.19382
2011	4	911	140491.3667	762.19382
2011	4	912	140491.3667	762.19382
2011	4	913	140491.3667	762.19382
2011	4	914	140491.3667	762.19382
2011	4	915	140491.3667	762.19382
2011	4	916	140519.6333	765.23688
2011	4	917	140519.6333	765.23688
2011	4	918	140519.6333	765.23688

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	919	140519.6333	765.23688
2011	4	920	140519.6333	765.23688
2011	4	921	140519.6333	765.23688
2011	4	922	140519.6333	765.23688
2011	4	923	140519.6333	765.23688
2011	4	924	140519.6333	765.23688
2011	4	925	140519.6333	765.23688
2011	4	926	140519.6333	765.23688
2011	4	927	140519.6333	765.23688
2011	4	928	140519.6333	765.23688
2011	4	929	140519.6333	765.23688
2011	4	930	140519.6333	765.23688
2011	4	931	140519.6333	765.23688
2011	4	932	140519.6333	765.23688
2011	4	933	140519.6333	765.23688
2011	4	934	140519.6333	765.23688
2011	4	935	140519.6333	765.23688
2011	4	936	140519.6333	765.23688
2011	4	937	140519.6333	765.23688
2011	4	938	140519.6333	765.23688
2011	4	939	140519.6333	765.23688
2011	4	940	140519.6333	765.23688
2011	4	941	140519.6333	765.23688
2011	4	942	140519.6333	765.23688
2011	4	943	140519.6333	765.23688
2011	4	944	140519.6333	765.23688
2011	4	945	140519.6333	765.23688
2011	4	946	140519.6333	765.23688
2011	4	947	140519.6333	765.23688
2011	4	948	140519.6333	765.23688
2011	4	949	140519.6333	765.23688
2011	4	950	140579.6333	771.73844
2011	4	951	140579.6333	771.73844
2011	4	952	140579.6333	771.73844
2011	4	953	140579.6333	771.73844
2011	4	954	140579.6333	771.73844
2011	4	955	140579.6333	771.73844
2011	4	956	140579.6333	771.73844
2011	4	957	140579.6333	771.73844
2011	4	958	140579.6333	771.73844
2011	4	959	140579.6333	771.73844
2011	4	960	140579.6333	771.73844
2011	4	961	140579.6333	771.73844
2011	4	962	140579.6333	771.73844
2011	4	963	140579.6333	771.73844
2011	4	964	140579.6333	771.73844
2011	4	965	140579.6333	771.73844
2011	4	966	140579.6333	771.73844
2011	4	967	140579.6333	771.73844
2011	4	968	140579.6333	771.73844
2011	4	969	140579.6333	771.73844

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	4	970	140579.6333	771.73844
2011	4	971	140579.6333	771.73844
2011	4	972	140579.6333	771.73844
2011	4	973	140579.6333	771.73844
2011	4	974	140579.6333	771.73844
2011	4	975	140579.6333	771.73844
2011	4	976	140579.6333	771.73844
2011	4	977	140579.6333	771.73844
2011	4	978	140579.6333	771.73844
2011	4	979	141234.6333	846.58831
2011	4	980	141234.6333	846.58831
2011	4	981	141267.9	850.58637
2011	4	982	141267.9	850.58637
2011	4	983	141267.9	850.58637
2011	4	984	141267.9	850.58637
2011	4	985	141268.1	850.61046
2011	4	986	141268.1	850.61046
2011	4	987	141268.5	850.65866
2011	4	988	141268.5	850.65866
2011	4	989	141268.5	850.65866
2011	4	990	141268.5	850.65866
2011	4	991	141268.5	850.65866
2011	4	992	141268.5	850.65866
2011	4	993	141269.3	850.75505
2011	4	994	141269.3	850.75505
2011	4	995	141269.3	850.75505
2011	4	996	141269.3	850.75505
2011	4	997	141269.3	850.75505
2011	4	998	141327.1	857.74988
2011	4	999	141328.1667	857.87952

May 2011

Net Benefit Tab

Effective_month	Test_result
May-2011	\$ 34.68

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	1.014002897	1.537404445

Curve Parameters Tab

a	b	c	d
2.195104289	0.000170655	15.8023762	32.08524423

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	1	20266.45161	32.0853
2011	5	2	20847.93548	32.08531
2011	5	3	20848.45161	32.08531
2011	5	4	22051.64516	32.08532
2011	5	5	25580.67742	32.08537
2011	5	6	30049.93548	32.08547
2011	5	7	31257.19355	32.08551
2011	5	8	31395.70968	32.08551
2011	5	9	33049.74194	32.08558
2011	5	10	33056.12903	32.08558
2011	5	11	33068.3871	32.08558
2011	5	12	33133.80645	32.08559
2011	5	13	33182.77419	32.08559
2011	5	14	33341.70968	32.0856
2011	5	15	35314.80645	32.0857
2011	5	16	35510.12903	32.08572
2011	5	17	35688.80645	32.08573
2011	5	18	36524.32258	32.08579
2011	5	19	36835	32.08581
2011	5	20	37274.41935	32.08584
2011	5	21	38629.54839	32.08596
2011	5	22	40728.35484	32.0862
2011	5	23	42294.29032	32.08642
2011	5	24	43587.41935	32.08665
2011	5	25	45524.22581	32.08707
2011	5	26	50146.93548	32.08865
2011	5	27	54652.35484	32.09148
2011	5	28	58714.45161	32.09602
2011	5	29	63631.29032	32.10611
2011	5	30	69128.19355	32.12894
2011	5	31	72556.03226	32.15453
2011	5	32	75477.67742	32.18786
2011	5	33	77803.12903	32.22553
2011	5	34	79695.06452	32.26616
2011	5	35	81303.54839	32.30984
2011	5	36	83312.25806	32.37948
2011	5	37	85062.77419	32.45756
2011	5	38	86640.90323	32.54556
2011	5	39	88346.67742	32.66421
2011	5	40	89325.09677	32.7456
2011	5	41	90449.70968	32.85339
2011	5	42	91670.09677	32.99036
2011	5	43	92481.35484	33.09467
2011	5	44	93339.51613	33.21811
2011	5	45	94674.48387	33.44083
2011	5	46	96546.64516	33.82882
2011	5	47	97496.25806	34.06626
2011	5	48	98889.93548	34.4745
2011	5	49	100343.5806	34.9902
2011	5	50	101329.4516	35.40192
2011	5	51	102433.4194	35.93261

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	52	103148.2581	36.32071
2011	5	53	103691.3226	36.64153
2011	5	54	104335.0323	37.05341
2011	5	55	105178.1613	37.64973
2011	5	56	105919.8065	38.23318
2011	5	57	106328	38.58
2011	5	58	106688.0968	38.90217
2011	5	59	107035.5161	39.22814
2011	5	60	107488.9032	39.67708
2011	5	61	108098.2903	40.32527
2011	5	62	108832.3871	41.18001
2011	5	63	109469.6452	41.99357
2011	5	64	110296.3548	43.15839
2011	5	65	111192.7419	44.57661
2011	5	66	111961.6452	45.93701
2011	5	67	112913.6774	47.82845
2011	5	68	113430.6452	48.96159
2011	5	69	114158.0645	50.69547
2011	5	70	114762.8065	52.27178
2011	5	71	115215.7419	53.53924
2011	5	72	115619.0323	54.7346
2011	5	73	115967.4516	55.82081
2011	5	74	116261.2903	56.77726
2011	5	75	116618.0323	57.9904
2011	5	76	116994.6774	59.33597
2011	5	77	117194.4516	60.07781
2011	5	78	117455.5161	61.07776
2011	5	79	117740.4516	62.20996
2011	5	80	117913.8387	62.92045
2011	5	81	118156.9355	63.94489
2011	5	82	118467.1613	65.30181
2011	5	83	118779.6129	66.72688
2011	5	84	119048.5806	68.0025
2011	5	85	119299.1935	69.2333
2011	5	86	119557.4516	70.54579
2011	5	87	119800.4839	71.82323
2011	5	88	119947.6452	72.61728
2011	5	89	120042.2581	73.13615
2011	5	90	120125.6452	73.59896
2011	5	91	120190.4839	73.96243
2011	5	92	120272.8387	74.42868
2011	5	93	120365.5806	74.95995
2011	5	94	120442.3548	75.4048
2011	5	95	120504.9677	75.771
2011	5	96	120605.1613	76.36345
2011	5	97	120707.3871	76.9762
2011	5	98	120774.2581	77.38161
2011	5	99	120858.2903	77.89626
2011	5	100	120952.4839	78.4801
2011	5	101	121033.6129	78.98891
2011	5	102	121093.7419	79.36962

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	103	121165.2258	79.82625
2011	5	104	121217.6774	80.1641
2011	5	105	121331.3871	80.90476
2011	5	106	121498.2258	82.01219
2011	5	107	121597.8065	82.68512
2011	5	108	121752.0323	83.74525
2011	5	109	121879.1935	84.63604
2011	5	110	122062.1613	85.94477
2011	5	111	122113.0323	86.3144
2011	5	112	122191.2903	86.88798
2011	5	113	122296.6129	87.66951
2011	5	114	122321.4839	87.85569
2011	5	115	122385.0968	88.33471
2011	5	116	122521.7742	89.37788
2011	5	117	122652.8387	90.39638
2011	5	118	122769.3548	91.31702
2011	5	119	122846.6774	91.93598
2011	5	120	122940.4516	92.69533
2011	5	121	122993.129	93.12611
2011	5	122	123129.2581	94.25356
2011	5	123	123181.6774	94.69324
2011	5	124	123190.6774	94.76904
2011	5	125	123230.3226	95.10404
2011	5	126	123269.6452	95.43809
2011	5	127	123340.5806	96.04517
2011	5	128	123354.2581	96.16289
2011	5	129	123455.6452	97.04232
2011	5	130	123488.7742	97.33228
2011	5	131	123538.0645	97.7661
2011	5	132	123665.2258	98.89865
2011	5	133	123707.1613	99.27641
2011	5	134	123832.4839	100.41811
2011	5	135	123869.0968	100.7553
2011	5	136	123923.3871	101.25836
2011	5	137	123995.2903	101.9303
2011	5	138	124046	102.40811
2011	5	139	124085.129	102.77903
2011	5	140	124145.0645	103.35099
2011	5	141	124224.5161	104.11632
2011	5	142	124375.7419	105.59582
2011	5	143	124451.2903	106.34628
2011	5	144	124594.871	107.79372
2011	5	145	124714.1613	109.01772
2011	5	146	124845.1935	110.38502
2011	5	147	124958.7742	111.58987
2011	5	148	125133.3548	113.47803
2011	5	149	125275.9032	115.05297
2011	5	150	125378	116.19967
2011	5	151	125622.8387	119.01457
2011	5	152	126060.4516	124.28251
2011	5	153	126298.3871	127.27951

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	154	126570.1935	130.82255
2011	5	155	126735.0645	133.03561
2011	5	156	126877.3226	134.98496
2011	5	157	127019.871	136.97604
2011	5	158	127145.871	138.76804
2011	5	159	127260.2903	140.42184
2011	5	160	127445.5161	143.15359
2011	5	161	127582.871	145.22371
2011	5	162	127720.4194	147.33542
2011	5	163	127813.0968	148.78042
2011	5	164	127943.871	150.8503
2011	5	165	128056.7097	152.66577
2011	5	166	128116.7419	153.64292
2011	5	167	128216.8387	155.28985
2011	5	168	128290.2903	156.51255
2011	5	169	128383.6774	158.08464
2011	5	170	128463.129	159.43776
2011	5	171	128574.5806	161.3604
2011	5	172	128694.3871	163.45955
2011	5	173	128812.129	165.55573
2011	5	174	128919	167.48732
2011	5	175	129005.129	169.06434
2011	5	176	129095.4839	170.73847
2011	5	177	129205.5806	172.80608
2011	5	178	129363.9032	175.83353
2011	5	179	129444.0645	177.39113
2011	5	180	129530.4516	179.0886
2011	5	181	129602.871	180.52688
2011	5	182	129678.0323	182.0345
2011	5	183	129767.4839	183.84873
2011	5	184	129864.4516	185.8402
2011	5	185	129937.7419	187.36272
2011	5	186	130004.871	188.77047
2011	5	187	130092.9032	190.63593
2011	5	188	130152.3548	191.90831
2011	5	189	130242.871	193.86515
2011	5	190	130341.9032	196.03356
2011	5	191	130462.1613	198.70584
2011	5	192	130558.5806	200.87982
2011	5	193	130633.0645	202.57862
2011	5	194	130694.6452	203.99604
2011	5	195	130777.9032	205.93116
2011	5	196	130866.0645	208.00399
2011	5	197	130934.6774	209.63429
2011	5	198	131016.0968	211.5885
2011	5	199	131134.4516	214.46764
2011	5	200	131219	216.55263
2011	5	201	131283.2581	218.15319
2011	5	202	131331.6129	219.36677
2011	5	203	131415.8065	221.49873
2011	5	204	131486.4516	223.30633

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	205	131557.6774	225.14626
2011	5	206	131641.2581	227.32792
2011	5	207	131688	228.55873
2011	5	208	131716.5161	229.31343
2011	5	209	131768.3871	230.69367
2011	5	210	131788.7742	231.23879
2011	5	211	131843.9032	232.72037
2011	5	212	131928.3871	235.01227
2011	5	213	131969.8387	236.14633
2011	5	214	132009.6452	237.24135
2011	5	215	132057.7097	238.57137
2011	5	216	132128.9032	240.55727
2011	5	217	132229.9677	243.40924
2011	5	218	132301.7097	245.4574
2011	5	219	132348.4516	246.8025
2011	5	220	132449.3871	249.73614
2011	5	221	132495.6774	251.09492
2011	5	222	132544.8065	252.5463
2011	5	223	133228.6452	273.77621
2011	5	224	133249.2581	274.44694
2011	5	225	133276.3226	275.33043
2011	5	226	133297.6129	276.02768
2011	5	227	133312.2581	276.50847
2011	5	228	133983.0323	299.57564
2011	5	229	133993.6452	299.95758
2011	5	230	134009.4194	300.52628
2011	5	231	134065.9355	302.57375
2011	5	232	134080.0968	303.08923
2011	5	233	134107.5806	304.09246
2011	5	234	134120.4839	304.56474
2011	5	235	134163.7097	306.15287
2011	5	236	134183.7742	306.89319
2011	5	237	134198.9355	307.45392
2011	5	238	134278.2581	310.40631
2011	5	239	134285.4839	310.67682
2011	5	240	134288.6452	310.79526
2011	5	241	134291.4194	310.89923
2011	5	242	134293.9677	310.99477
2011	5	243	134296.3871	311.08551
2011	5	244	134306.4839	311.4645
2011	5	245	134309	311.55902
2011	5	246	134326.2258	312.20701
2011	5	247	134335.2581	312.54738
2011	5	248	134341.4839	312.78224
2011	5	249	134341.8065	312.79441
2011	5	250	134346.7742	312.98196
2011	5	251	134356.8387	313.3623
2011	5	252	134364.3871	313.6479
2011	5	253	134784.4839	330.00823
2011	5	254	134794.5161	330.41033
2011	5	255	134805.4516	330.84926

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	256	134887.9032	334.17955
2011	5	257	134902.871	334.78808
2011	5	258	134918.6774	335.43204
2011	5	259	134944.0645	336.46919
2011	5	260	134955.3226	336.93025
2011	5	261	134958.9677	337.07968
2011	5	262	134975.1613	337.74442
2011	5	263	134991.4194	338.41327
2011	5	264	135011	339.22075
2011	5	265	135014.9032	339.38196
2011	5	266	135037.0645	340.29891
2011	5	267	135038.7742	340.36977
2011	5	268	135050.0645	340.83808
2011	5	269	135074.9677	341.87355
2011	5	270	135096.9355	342.78985
2011	5	271	135115.7419	343.57644
2011	5	272	135138.129	344.51539
2011	5	273	135162.3548	345.53465
2011	5	274	135200.4194	347.14287
2011	5	275	135226.1935	348.2365
2011	5	276	135244.4839	349.01489
2011	5	277	135253.6452	349.40549
2011	5	278	135256.9677	349.54727
2011	5	279	135262.9355	349.80209
2011	5	280	135275.7419	350.34959
2011	5	281	135280.7097	350.56223
2011	5	282	135289.0968	350.92155
2011	5	283	135316.5806	352.10185
2011	5	284	135318.7097	352.19346
2011	5	285	135327.7742	352.58381
2011	5	286	135338.6452	353.05258
2011	5	287	135353.0323	353.67402
2011	5	288	135359.9355	353.97263
2011	5	289	135366.5806	354.26033
2011	5	290	135374.5806	354.60704
2011	5	291	135380.7097	354.87291
2011	5	292	135381.4839	354.90651
2011	5	293	135382.2581	354.94011
2011	5	294	135392.9677	355.40532
2011	5	295	135393.4516	355.42635
2011	5	296	135398.3548	355.63957
2011	5	297	135408.5484	356.0833
2011	5	298	135427.8387	356.92468
2011	5	299	135428.0645	356.93454
2011	5	300	135445.0323	357.67644
2011	5	301	135445.1613	357.68209
2011	5	302	135450.6452	357.92223
2011	5	303	135450.6452	357.92223
2011	5	304	135644.9355	366.54569
2011	5	305	135646.3226	366.60807
2011	5	306	135646.3226	366.60807

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	307	135670.7742	367.70959
2011	5	308	135670.7742	367.70959
2011	5	309	135681.0323	368.17279
2011	5	310	135682.4839	368.23838
2011	5	311	135682.4839	368.23838
2011	5	312	135683.2258	368.27192
2011	5	313	135683.2258	368.27192
2011	5	314	135688.4839	368.50966
2011	5	315	135709.871	369.4784
2011	5	316	135716.871	369.79608
2011	5	317	135717.5806	369.8283
2011	5	318	135718.3226	369.86199
2011	5	319	135723.0645	370.07741
2011	5	320	135741.0323	370.89487
2011	5	321	135741.871	370.93308
2011	5	322	135741.9032	370.93455
2011	5	323	135751.2903	371.36246
2011	5	324	135751.2903	371.36246
2011	5	325	135751.3226	371.36394
2011	5	326	135751.3226	371.36394
2011	5	327	135751.3548	371.36541
2011	5	328	135753.6129	371.46842
2011	5	329	135755.0645	371.53466
2011	5	330	135775.0323	372.44716
2011	5	331	135778.0323	372.58447
2011	5	332	135780.1613	372.68195
2011	5	333	135780.871	372.71445
2011	5	334	135791.7742	373.21414
2011	5	335	135797.871	373.49387
2011	5	336	135800.0968	373.59605
2011	5	337	135800.0968	373.59605
2011	5	338	135804.7742	373.81088
2011	5	339	135805.4194	373.84052
2011	5	340	135807.4194	373.93243
2011	5	341	135808.7742	373.9947
2011	5	342	135813.5161	374.21275
2011	5	343	135818.7419	374.45321
2011	5	344	135825.4516	374.76219
2011	5	345	135827.9677	374.87813
2011	5	346	135851.5161	375.96512
2011	5	347	135852.9032	376.02926
2011	5	348	135861.0645	376.40686
2011	5	349	135871.3871	376.88505
2011	5	350	135876.5484	377.12439
2011	5	351	135885.8387	377.55563
2011	5	352	135898.129	378.12695
2011	5	353	135914.1935	378.87513
2011	5	354	135936.3871	379.91144
2011	5	355	135937.6129	379.96876
2011	5	356	135945.2258	380.32501
2011	5	357	135953.7419	380.72396

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	358	135954.2903	380.74966
2011	5	359	135976.7097	381.80219
2011	5	360	135986.5484	382.26509
2011	5	361	136036.7097	384.63466
2011	5	362	136051.6452	385.34329
2011	5	363	136055.7097	385.53639
2011	5	364	136125.0645	388.84753
2011	5	365	136128	388.98836
2011	5	366	136128.7097	389.02241
2011	5	367	136128.9355	389.03325
2011	5	368	136130.4516	389.10601
2011	5	369	136136.4194	389.39258
2011	5	370	136137.8387	389.46077
2011	5	371	136226.7742	393.75954
2011	5	372	136250.4839	394.91427
2011	5	373	136254.5161	395.11102
2011	5	374	136269.7419	395.85491
2011	5	375	136273.3548	396.03165
2011	5	376	136276.9032	396.20532
2011	5	377	136292.129	396.95145
2011	5	378	136333.0968	398.96664
2011	5	379	136399.4839	402.25587
2011	5	380	136405.4194	402.55139
2011	5	381	136418.9032	403.22359
2011	5	382	136426.2258	403.58915
2011	5	383	136440	404.27777
2011	5	384	136461.0645	405.33332
2011	5	385	136496	407.09056
2011	5	386	136514.4839	408.02363
2011	5	387	136545	409.56918
2011	5	388	136556.3548	410.14589
2011	5	389	136567.5484	410.71527
2011	5	390	136571.0968	410.89594
2011	5	391	136578.0968	411.25261
2011	5	392	136581.2258	411.41216
2011	5	393	136586.9032	411.70181
2011	5	394	136606.5161	412.70413
2011	5	395	136616.3871	413.20958
2011	5	396	136626.8065	413.74385
2011	5	397	136654.6452	415.17499
2011	5	398	136655.8387	415.23647
2011	5	399	136663.1935	415.61552
2011	5	400	136675.5484	416.25312
2011	5	401	136728.5806	419.002
2011	5	402	136737.6452	419.47381
2011	5	403	136758.1935	420.5455
2011	5	404	136767.4839	421.03101
2011	5	405	136792.5484	422.34389
2011	5	406	136798.4839	422.65544
2011	5	407	136817.0968	423.63403
2011	5	408	136839.4839	424.81431

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	409	136857.0968	425.74538
2011	5	410	136878.4194	426.87551
2011	5	411	136902.6129	428.16174
2011	5	412	136916.2258	428.8873
2011	5	413	136934.2581	429.85045
2011	5	414	136959.3548	431.19484
2011	5	415	137027.3871	434.86208
2011	5	416	137042.0645	435.65767
2011	5	417	137061.3548	436.70569
2011	5	418	137084.5484	437.96937
2011	5	419	137103.871	439.02516
2011	5	420	137116.8387	439.73526
2011	5	421	137154.5161	441.80547
2011	5	422	137221.871	445.53256
2011	5	423	137253.3871	447.28813
2011	5	424	137263.3548	447.84492
2011	5	425	137281.9032	448.88301
2011	5	426	137295.2258	449.63023
2011	5	427	137305.4194	450.20286
2011	5	428	137317.4194	450.87797
2011	5	429	137334.9355	451.86537
2011	5	430	137394.6774	455.25063
2011	5	431	137411.3226	456.19868
2011	5	432	137418.6452	456.61642
2011	5	433	137443.4194	458.03279
2011	5	434	137453.3548	458.60214
2011	5	435	137466.8387	459.37605
2011	5	436	137484.9032	460.41507
2011	5	437	137496.0323	461.05644
2011	5	438	137507.2258	461.70249
2011	5	439	137523.8065	462.66126
2011	5	440	137536.7742	463.4126
2011	5	441	137544.9032	463.88426
2011	5	442	137557.7097	464.62836
2011	5	443	137575.4839	465.66322
2011	5	444	137589.4516	466.4782
2011	5	445	137606.6452	467.4835
2011	5	446	137620.3226	468.28488
2011	5	447	137629.7742	468.83952
2011	5	448	137636.0645	469.20904
2011	5	449	137659.0645	470.56282
2011	5	450	137668.0645	471.0937
2011	5	451	137681.1613	471.86739
2011	5	452	137780.8387	477.80065
2011	5	453	137789.9032	478.34416
2011	5	454	137820.7419	480.19825
2011	5	455	137833.7097	480.98019
2011	5	456	137852.5484	482.11858
2011	5	457	137871.9032	483.29117
2011	5	458	137889.5161	484.36088
2011	5	459	137903.2903	485.19921

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	460	137924.9677	486.5217
2011	5	461	137948.5484	487.96469
2011	5	462	137963.4516	488.87904
2011	5	463	137976.0323	489.65232
2011	5	464	138008.4194	491.64904
2011	5	465	138024.5806	492.64867
2011	5	466	138048.0645	494.1051
2011	5	467	138182.9355	502.55921
2011	5	468	138198.129	503.52123
2011	5	469	138217.5806	504.75573
2011	5	470	138243.7097	506.41911
2011	5	471	138263.3871	507.67564
2011	5	472	138303.5806	510.2526
2011	5	473	138322.1935	511.45068
2011	5	474	138337.6129	512.44546
2011	5	475	138349.7419	513.22942
2011	5	476	138363.871	514.14426
2011	5	477	138377.6452	515.0378
2011	5	478	138417.9032	517.65887
2011	5	479	138425	518.12239
2011	5	480	138437.6452	518.94939
2011	5	481	138454.2581	520.03803
2011	5	482	138467	520.87466
2011	5	483	138599.9032	529.68694
2011	5	484	138618.6129	530.9402
2011	5	485	138640.7097	532.4244
2011	5	486	138652.2258	533.19967
2011	5	487	138661.9032	533.85209
2011	5	488	138670.7097	534.44653
2011	5	489	138682.2581	535.22711
2011	5	490	138705.9355	536.83132
2011	5	491	138720.9355	537.85026
2011	5	492	138732.5484	538.64053
2011	5	493	138746.3226	539.57947
2011	5	494	138760.2258	540.52898
2011	5	495	138777.0968	541.68355
2011	5	496	138792.9677	542.77208
2011	5	497	138806.1935	543.68097
2011	5	498	138841.7097	546.12966
2011	5	499	138865.3871	547.76864
2011	5	500	138874.5484	548.40419
2011	5	501	138914.4516	551.18158
2011	5	502	138927.5806	552.09867
2011	5	503	138936.5161	552.72375
2011	5	504	138953.0323	553.88112
2011	5	505	138975.3226	555.4472
2011	5	506	138979.6129	555.74917
2011	5	507	138991.129	556.56058
2011	5	508	138996.8065	556.96107
2011	5	509	139006.5161	557.6467
2011	5	510	139048.7097	560.63653

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	511	139061.1935	561.5244
2011	5	512	139086.6774	563.34146
2011	5	513	139103.2258	564.52475
2011	5	514	139116.3548	565.4654
2011	5	515	139123.3226	565.9653
2011	5	516	139127.3871	566.25712
2011	5	517	139138.871	567.08249
2011	5	518	139166.4194	569.06766
2011	5	519	139176.0645	569.76444
2011	5	520	139209.3871	572.17868
2011	5	521	139217.0968	572.73879
2011	5	522	139227.9677	573.52956
2011	5	523	139232.5806	573.86546
2011	5	524	139243.6452	574.672
2011	5	525	139250.0645	575.14048
2011	5	526	139253.1613	575.36663
2011	5	527	139262.5806	576.05507
2011	5	528	139301.4194	578.90293
2011	5	529	139307.9032	579.37982
2011	5	530	139312.0645	579.68609
2011	5	531	139354.2258	582.79892
2011	5	532	139360.0323	583.229
2011	5	533	139364.5806	583.56614
2011	5	534	139375.9677	584.41107
2011	5	535	139573	599.23772
2011	5	536	139599.1613	601.23605
2011	5	537	139611.9677	602.21684
2011	5	538	139616.0323	602.52848
2011	5	539	139618.0323	602.68188
2011	5	540	139618.0323	602.68188
2011	5	541	139618.2258	602.69673
2011	5	542	139633.7097	603.88583
2011	5	543	139634.7097	603.96271
2011	5	544	139649	605.0625
2011	5	545	139654.0323	605.45028
2011	5	546	139656.3226	605.62686
2011	5	547	139656.3226	605.62686
2011	5	548	139664.8387	606.28392
2011	5	549	139675.0645	607.07387
2011	5	550	139675.6452	607.11876
2011	5	551	139677.7742	607.28338
2011	5	552	139694.129	608.54954
2011	5	553	139695.9677	608.69206
2011	5	554	139728	611.18062
2011	5	555	139751.0645	612.97913
2011	5	556	139752.3548	613.07991
2011	5	557	139766.2258	614.16441
2011	5	558	139768.0645	614.30832
2011	5	559	139769.5806	614.42701
2011	5	560	139770.129	614.46995
2011	5	561	139771.6774	614.5912

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	562	139772.0968	614.62404
2011	5	563	139783.7742	615.53933
2011	5	564	139789.0968	615.957
2011	5	565	139804.9032	617.1991
2011	5	566	139829.0323	619.10032
2011	5	567	139838.9355	619.88241
2011	5	568	139851.5484	620.88001
2011	5	569	139897.0323	624.49158
2011	5	570	139898.1613	624.58151
2011	5	571	139909.129	625.45582
2011	5	572	139932.9032	627.35546
2011	5	573	139932.9355	627.35804
2011	5	574	139933.5161	627.40452
2011	5	575	139933.5161	627.40452
2011	5	576	139938.3871	627.79451
2011	5	577	139938.3871	627.79451
2011	5	578	139938.4516	627.79967
2011	5	579	139938.4516	627.79967
2011	5	580	139943.1935	628.17958
2011	5	581	139943.2258	628.18217
2011	5	582	139949.7742	628.7072
2011	5	583	140008.0323	633.3986
2011	5	584	140008.0323	633.3986
2011	5	585	140008.0323	633.3986
2011	5	586	140010.129	633.56814
2011	5	587	140029.3226	635.12226
2011	5	588	140032.9677	635.41786
2011	5	589	140034.6129	635.55132
2011	5	590	140034.6129	635.55132
2011	5	591	140035.9032	635.65602
2011	5	592	140035.9032	635.65602
2011	5	593	140035.9355	635.65864
2011	5	594	140035.9355	635.65864
2011	5	595	140035.9355	635.65864
2011	5	596	140046.6452	636.52833
2011	5	597	140046.6452	636.52833
2011	5	598	140126.6129	643.06193
2011	5	599	140146.6452	644.70965
2011	5	600	140152.1613	645.16415
2011	5	601	140161.871	645.965
2011	5	602	140177.4516	647.25227
2011	5	603	140187.4516	648.07989
2011	5	604	140197.5806	648.91932
2011	5	605	140202.7419	649.3475
2011	5	606	140202.7419	649.3475
2011	5	607	140229.0968	651.53851
2011	5	608	140229.4194	651.56538
2011	5	609	140234.9355	652.02497
2011	5	610	140234.9355	652.02497
2011	5	611	140249.5161	653.24142
2011	5	612	140249.5484	653.24412

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	613	140249.5484	653.24412
2011	5	614	140249.5484	653.24412
2011	5	615	140249.5484	653.24412
2011	5	616	140254.3871	653.64834
2011	5	617	140254.3871	653.64834
2011	5	618	140259.2581	654.05552
2011	5	619	140259.2581	654.05552
2011	5	620	140264.1613	654.46567
2011	5	621	140264.8387	654.52235
2011	5	622	140285.6774	656.26866
2011	5	623	140285.6774	656.26866
2011	5	624	140286.3548	656.32551
2011	5	625	140288.3871	656.49609
2011	5	626	140293.5806	656.93224
2011	5	627	140318.5806	659.03596
2011	5	628	140324.4516	659.53103
2011	5	629	140324.4516	659.53103
2011	5	630	140324.4516	659.53103
2011	5	631	140350.1613	661.70357
2011	5	632	140350.8387	661.76092
2011	5	633	140360.9677	662.619
2011	5	634	140361.3871	662.65455
2011	5	635	140367.5806	663.17984
2011	5	636	140373.3226	663.66721
2011	5	637	140431.5806	668.63352
2011	5	638	140464.9032	671.49169
2011	5	639	140468.7742	671.82454
2011	5	640	140472.5161	672.14647
2011	5	641	140495.5484	674.13154
2011	5	642	140501.0323	674.60508
2011	5	643	140505.5161	674.99253
2011	5	644	140510.4839	675.42207
2011	5	645	140515.8065	675.8826
2011	5	646	140521.7419	676.39655
2011	5	647	140532.3548	677.31655
2011	5	648	140536.5161	677.67763
2011	5	649	140543.3226	678.26868
2011	5	650	140545.871	678.49011
2011	5	651	140547.4839	678.6303
2011	5	652	140560.6452	679.77536
2011	5	653	140564.8065	680.13782
2011	5	654	140566.4194	680.27836
2011	5	655	140567.9355	680.4105
2011	5	656	140591.7097	682.48608
2011	5	657	140593.4839	682.64124
2011	5	658	140594.8065	682.75693
2011	5	659	140596.6452	682.91779
2011	5	660	140600.3226	683.23965
2011	5	661	140604.0968	683.57015
2011	5	662	140606.6774	683.79622
2011	5	663	140610.2258	684.10721

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	664	140612.9677	684.34761
2011	5	665	140616.3871	684.64754
2011	5	666	140618.4839	684.83152
2011	5	667	140622.7097	685.20248
2011	5	668	140625.0323	685.40645
2011	5	669	140637.7097	686.52093
2011	5	670	140639.6452	686.69125
2011	5	671	140641.6452	686.86729
2011	5	672	140644.2258	687.09451
2011	5	673	140647.2258	687.35875
2011	5	674	140650.2903	687.62879
2011	5	675	140659.9355	688.47941
2011	5	676	140662.5161	688.70719
2011	5	677	140665.3871	688.96069
2011	5	678	140673.871	689.71036
2011	5	679	140686.8065	690.85504
2011	5	680	140688.1613	690.97504
2011	5	681	140689.129	691.06078
2011	5	682	140693.7742	691.47245
2011	5	683	140694.7097	691.55539
2011	5	684	140695.3226	691.60973
2011	5	685	140697.3226	691.78709
2011	5	686	140701.6129	692.16773
2011	5	687	140701.6129	692.16773
2011	5	688	140701.6129	692.16773
2011	5	689	140705.3226	692.49703
2011	5	690	140705.3226	692.49703
2011	5	691	140706	692.55718
2011	5	692	140724.7097	694.22064
2011	5	693	140726.2581	694.35849
2011	5	694	140726.2581	694.35849
2011	5	695	140726.9355	694.41881
2011	5	696	140735.4839	695.18046
2011	5	697	140737.5806	695.36741
2011	5	698	140740.6774	695.64363
2011	5	699	140743	695.85086
2011	5	700	140743	695.85086
2011	5	701	140752.2903	696.68045
2011	5	702	140762.8065	697.62075
2011	5	703	140768.2258	698.10584
2011	5	704	140768.9032	698.1665
2011	5	705	140782.0645	699.34615
2011	5	706	140785.8387	699.68482
2011	5	707	140792.3226	700.26704
2011	5	708	140799	700.86717
2011	5	709	140801.129	701.05863
2011	5	710	140807.0645	701.59268
2011	5	711	140812.3871	702.07195
2011	5	712	140812.3871	702.07195
2011	5	713	140816.0968	702.40619
2011	5	714	140830.3226	703.68946

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	715	140836.0323	704.20521
2011	5	716	140838.2258	704.40346
2011	5	717	140845.6452	705.07443
2011	5	718	140847.871	705.27585
2011	5	719	140850.9355	705.55326
2011	5	720	140850.9355	705.55326
2011	5	721	140863.0645	706.65238
2011	5	722	140866.7742	706.9889
2011	5	723	140884.0968	708.56254
2011	5	724	140884.0968	708.56254
2011	5	725	140888.4839	708.96166
2011	5	726	140888.4839	708.96166
2011	5	727	140890.7097	709.16425
2011	5	728	140892.3548	709.31402
2011	5	729	140909.2903	710.85776
2011	5	730	140911.3871	711.04913
2011	5	731	140923.9677	712.19851
2011	5	732	140939.6129	713.63058
2011	5	733	140943.3226	713.97058
2011	5	734	140943.3226	713.97058
2011	5	735	140963.5806	715.8303
2011	5	736	140963.5806	715.8303
2011	5	737	140976.0968	716.98183
2011	5	738	140990.7419	718.3317
2011	5	739	140993.8387	718.61747
2011	5	740	140996.9355	718.90337
2011	5	741	141014.7419	720.54957
2011	5	742	141031.5484	722.10695
2011	5	743	141031.5484	722.10695
2011	5	744	141037.5484	722.6638
2011	5	745	141042.9677	723.16714
2011	5	746	141047.8065	723.61686
2011	5	747	141050.8065	723.89584
2011	5	748	141055.4516	724.32802
2011	5	749	141060.2903	724.7785
2011	5	750	141061.5806	724.89868
2011	5	751	141064.7742	725.19621
2011	5	752	141064.7742	725.19621
2011	5	753	141068.7097	725.56303
2011	5	754	141079	726.52311
2011	5	755	141079	726.52311
2011	5	756	141089.129	727.46944
2011	5	757	141092.3548	727.77109
2011	5	758	141092.3548	727.77109
2011	5	759	141098.2903	728.32647
2011	5	760	141119.0323	730.27076
2011	5	761	141119.0323	730.27076
2011	5	762	141123.4516	730.68572
2011	5	763	141124.7419	730.80692
2011	5	764	141124.7419	730.80692
2011	5	765	141135.871	731.85316

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	766	141139.5806	732.20225
2011	5	767	141140.871	732.32372
2011	5	768	141140.871	732.32372
2011	5	769	141144.5806	732.67305
2011	5	770	141155.7097	733.72209
2011	5	771	141182.4516	736.24924
2011	5	772	141182.4516	736.24924
2011	5	773	141188.5806	736.82972
2011	5	774	141206.871	738.56485
2011	5	775	141211.871	739.03993
2011	5	776	141211.871	739.03993
2011	5	777	141211.871	739.03993
2011	5	778	141214.3871	739.27912
2011	5	779	141214.3871	739.27912
2011	5	780	141218.0968	739.63192
2011	5	781	141221.8065	739.98489
2011	5	782	141231.4839	740.90653
2011	5	783	141249.8065	742.65478
2011	5	784	141249.8065	742.65478
2011	5	785	141249.8065	742.65478
2011	5	786	141254.6452	743.11719
2011	5	787	141257.7419	743.41328
2011	5	788	141257.7419	743.41328
2011	5	789	141262.2903	743.8484
2011	5	790	141264.5161	744.06143
2011	5	791	141270.8387	744.66689
2011	5	792	141279.7419	745.52036
2011	5	793	141306.8387	748.12417
2011	5	794	141306.8387	748.12417
2011	5	795	141306.8387	748.12417
2011	5	796	141306.8387	748.12417
2011	5	797	141306.8387	748.12417
2011	5	798	141306.8387	748.12417
2011	5	799	141306.8387	748.12417
2011	5	800	141309.0968	748.34158
2011	5	801	141309.0968	748.34158
2011	5	802	141309.0968	748.34158
2011	5	803	141309.0968	748.34158
2011	5	804	141310.5806	748.48449
2011	5	805	141325.4194	749.91513
2011	5	806	141325.4194	749.91513
2011	5	807	141325.4194	749.91513
2011	5	808	141335.0968	750.84969
2011	5	809	141336.6452	750.99933
2011	5	810	141391.9355	756.36331
2011	5	811	141391.9355	756.36331
2011	5	812	141391.9355	756.36331
2011	5	813	141391.9355	756.36331
2011	5	814	141391.9355	756.36331
2011	5	815	141395.6452	756.72463
2011	5	816	141395.6452	756.72463

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	817	141395.6452	756.72463
2011	5	818	141410.1613	758.14023
2011	5	819	141410.1613	758.14023
2011	5	820	141410.1613	758.14023
2011	5	821	141410.1613	758.14023
2011	5	822	141410.1613	758.14023
2011	5	823	141410.1613	758.14023
2011	5	824	141413.871	758.50244
2011	5	825	141420.2903	759.12965
2011	5	826	141423.3871	759.43242
2011	5	827	141423.3871	759.43242
2011	5	828	141423.3871	759.43242
2011	5	829	141423.3871	759.43242
2011	5	830	141428.129	759.89627
2011	5	831	141428.129	759.89627
2011	5	832	141429.7097	760.05095
2011	5	833	141429.7097	760.05095
2011	5	834	141429.7097	760.05095
2011	5	835	141429.7097	760.05095
2011	5	836	141434.3548	760.50572
2011	5	837	141435.9355	760.66054
2011	5	838	141435.9355	760.66054
2011	5	839	141437.5161	760.81538
2011	5	840	141437.5161	760.81538
2011	5	841	141437.5161	760.81538
2011	5	842	141437.5161	760.81538
2011	5	843	141437.5161	760.81538
2011	5	844	141439.0645	760.9671
2011	5	845	141439.0645	760.9671
2011	5	846	141439.0645	760.9671
2011	5	847	141439.0645	760.9671
2011	5	848	141439.0645	760.9671
2011	5	849	141440.6452	761.12201
2011	5	850	141440.6452	761.12201
2011	5	851	141440.6452	761.12201
2011	5	852	141440.6452	761.12201
2011	5	853	141440.6452	761.12201
2011	5	854	141440.6452	761.12201
2011	5	855	141442.2258	761.27696
2011	5	856	141442.2258	761.27696
2011	5	857	141442.2258	761.27696
2011	5	858	141442.2258	761.27696
2011	5	859	141442.5806	761.31174
2011	5	860	141442.5806	761.31174
2011	5	861	141443.2903	761.38133
2011	5	862	141443.2903	761.38133
2011	5	863	141443.2903	761.38133
2011	5	864	141443.2903	761.38133
2011	5	865	141448.0323	761.84642
2011	5	866	141448.0323	761.84642
2011	5	867	141448.0323	761.84642

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	868	141449.6129	762.00152
2011	5	869	141449.6129	762.00152
2011	5	870	141449.6129	762.00152
2011	5	871	141449.6129	762.00152
2011	5	872	141449.6129	762.00152
2011	5	873	141449.6129	762.00152
2011	5	874	141494.7742	766.44685
2011	5	875	141494.7742	766.44685
2011	5	876	141495.129	766.48188
2011	5	877	141495.129	766.48188
2011	5	878	141495.129	766.48188
2011	5	879	141496.7097	766.63797
2011	5	880	141497.7742	766.7431
2011	5	881	141497.7742	766.7431
2011	5	882	141498.129	766.77815
2011	5	883	141498.129	766.77815
2011	5	884	141498.129	766.77815
2011	5	885	141502.871	767.24669
2011	5	886	141502.871	767.24669
2011	5	887	141502.871	767.24669
2011	5	888	141502.871	767.24669
2011	5	889	141502.871	767.24669
2011	5	890	141503.5806	767.31684
2011	5	891	141503.5806	767.31684
2011	5	892	141503.5806	767.31684
2011	5	893	141503.5806	767.31684
2011	5	894	141503.5806	767.31684
2011	5	895	141508.3226	767.78572
2011	5	896	141508.3226	767.78572
2011	5	897	141508.3226	767.78572
2011	5	898	141508.3226	767.78572
2011	5	899	141508.6774	767.82082
2011	5	900	141508.6774	767.82082
2011	5	901	141508.6774	767.82082
2011	5	902	141510.2581	767.97719
2011	5	903	141510.6129	768.01229
2011	5	904	141512.1935	768.1687
2011	5	905	141512.1935	768.1687
2011	5	906	141512.1935	768.1687
2011	5	907	141515.3548	768.48162
2011	5	908	141515.3548	768.48162
2011	5	909	141516.9355	768.63813
2011	5	910	141516.9355	768.63813
2011	5	911	141516.9355	768.63813
2011	5	912	141516.9355	768.63813
2011	5	913	141516.9355	768.63813
2011	5	914	141518.5161	768.79467
2011	5	915	141518.871	768.82982
2011	5	916	141518.871	768.82982
2011	5	917	141518.871	768.82982
2011	5	918	141518.871	768.82982

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	919	141518.871	768.82982
2011	5	920	141519.2258	768.86496
2011	5	921	141519.2258	768.86496
2011	5	922	141519.2258	768.86496
2011	5	923	141519.2258	768.86496
2011	5	924	141519.2258	768.86496
2011	5	925	141519.2258	768.86496
2011	5	926	141519.2258	768.86496
2011	5	927	141519.2258	768.86496
2011	5	928	141519.2258	768.86496
2011	5	929	141519.2258	768.86496
2011	5	930	141520.2903	768.97042
2011	5	931	141520.2903	768.97042
2011	5	932	141520.2903	768.97042
2011	5	933	141520.2903	768.97042
2011	5	934	141525.0323	769.44036
2011	5	935	141525.0323	769.44036
2011	5	936	141525.0323	769.44036
2011	5	937	141525.0323	769.44036
2011	5	938	141525.3871	769.47553
2011	5	939	141525.3871	769.47553
2011	5	940	141525.3871	769.47553
2011	5	941	141525.3871	769.47553
2011	5	942	141525.3871	769.47553
2011	5	943	141525.3871	769.47553
2011	5	944	141525.3871	769.47553
2011	5	945	141525.3871	769.47553
2011	5	946	141525.3871	769.47553
2011	5	947	141570.5484	773.96638
2011	5	948	141570.5484	773.96638
2011	5	949	141570.5484	773.96638
2011	5	950	141572.129	774.12405
2011	5	951	141573.7097	774.28176
2011	5	952	141573.7097	774.28176
2011	5	953	141573.7097	774.28176
2011	5	954	141573.7097	774.28176
2011	5	955	141573.7097	774.28176
2011	5	956	141573.7097	774.28176
2011	5	957	141573.7097	774.28176
2011	5	958	141573.7097	774.28176
2011	5	959	141573.7097	774.28176
2011	5	960	141573.7097	774.28176
2011	5	961	141573.7097	774.28176
2011	5	962	141573.7097	774.28176
2011	5	963	141573.7097	774.28176
2011	5	964	141573.7097	774.28176
2011	5	965	141573.7097	774.28176
2011	5	966	141573.7097	774.28176
2011	5	967	141573.7097	774.28176
2011	5	968	141573.7097	774.28176
2011	5	969	141573.7097	774.28176

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	5	970	141573.7097	774.28176
2011	5	971	141573.7097	774.28176
2011	5	972	141573.7097	774.28176
2011	5	973	141573.7097	774.28176
2011	5	974	141573.7097	774.28176
2011	5	975	141573.7097	774.28176
2011	5	976	141573.7097	774.28176
2011	5	977	141573.7097	774.28176
2011	5	978	141573.7097	774.28176
2011	5	979	141573.7097	774.28176
2011	5	980	141573.7097	774.28176
2011	5	981	141638.7097	780.7962
2011	5	982	141638.7097	780.7962
2011	5	983	141638.7097	780.7962
2011	5	984	141638.7097	780.7962
2011	5	985	141638.7097	780.7962
2011	5	986	141638.7097	780.7962
2011	5	987	141638.7097	780.7962
2011	5	988	141638.7097	780.7962
2011	5	989	141638.7097	780.7962
2011	5	990	141638.7097	780.7962
2011	5	991	141638.7097	780.7962
2011	5	992	141638.7097	780.7962
2011	5	993	141638.7097	780.7962
2011	5	994	141638.7097	780.7962
2011	5	995	141638.7097	780.7962
2011	5	996	141638.7097	780.7962
2011	5	997	141638.7097	780.7962
2011	5	998	141695.7097	786.55589
2011	5	999	141696.5484	786.64097

June 2011

Net Benefit Tab

Effective_month	Test_result
June-2011	\$ 35.09

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.884662693	1.427114373

Curve Parameters Tab

a	b	c	d
2.810288551	0.000146875	15.86241879	33.04103809

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	1	20312.33333	33.04104
2011	6	2	20786.1	33.04104
2011	6	3	20793.73333	33.04104
2011	6	4	22010.63333	33.04104
2011	6	5	25498.03333	33.04104
2011	6	6	27956.26667	33.04105
2011	6	7	29726.73333	33.04105
2011	6	8	31337.7	33.04105
2011	6	9	33056.8	33.04105
2011	6	10	33064	33.04105
2011	6	11	33064.33333	33.04105
2011	6	12	33125.13333	33.04105
2011	6	13	33228.96667	33.04105
2011	6	14	33263.23333	33.04105
2011	6	15	35596.76667	33.04106
2011	6	16	35667	33.04106
2011	6	17	35982.96667	33.04106
2011	6	18	36070.06667	33.04106
2011	6	19	36929.8	33.04106
2011	6	20	37397.3	33.04106
2011	6	21	38732.66667	33.04107
2011	6	22	41321.33333	33.04108
2011	6	23	42951.26667	33.04109
2011	6	24	44741.06667	33.04111
2011	6	25	46795.03333	33.04113
2011	6	26	49847.63333	33.04119
2011	6	27	55941.1	33.04141
2011	6	28	61906.1	33.04196
2011	6	29	68057.4	33.04339
2011	6	30	74541.33333	33.04733
2011	6	31	78606.3	33.05271
2011	6	32	81646.66667	33.05956
2011	6	33	84568	33.0699
2011	6	34	86792.83333	33.08151
2011	6	35	89167.63333	33.09909
2011	6	36	91324.36667	33.12159
2011	6	37	93136.9	33.14712
2011	6	38	95112.73333	33.18425
2011	6	39	96733.1	33.22421
2011	6	40	98268.66667	33.27233
2011	6	41	99642.6	33.326
2011	6	42	100964.9667	33.38939
2011	6	43	102651.8667	33.49113
2011	6	44	104196.3	33.61013
2011	6	45	105912.7333	33.77963
2011	6	46	107437.6	33.97214
2011	6	47	108890.5333	34.20206
2011	6	48	110041.8	34.42392
2011	6	49	111060.8	34.65541
2011	6	50	111941.7667	34.88656
2011	6	51	112751.3333	35.12804

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	52	113425.1333	35.35295
2011	6	53	113990.5667	35.56028
2011	6	54	114882.9333	35.92598
2011	6	55	115425.2333	36.17368
2011	6	56	116020.3	36.47001
2011	6	57	116590.1	36.78001
2011	6	58	117046.7	37.04853
2011	6	59	117550.9	37.3675
2011	6	60	118129.2333	37.76475
2011	6	61	118710.8667	38.20106
2011	6	62	119211.6333	38.60886
2011	6	63	119931.8333	39.25251
2011	6	64	120797.0333	40.12487
2011	6	65	121341.6	40.73573
2011	6	66	121949	41.47942
2011	6	67	122704.0333	42.50485
2011	6	68	123412.2	43.5796
2011	6	69	124662.3333	45.78335
2011	6	70	125045.4333	46.54682
2011	6	71	125640.8667	47.82526
2011	6	72	126269.9333	49.3076
2011	6	73	126617.3	50.18891
2011	6	74	126879.9	50.88671
2011	6	75	127246.4333	51.90843
2011	6	76	127540.1667	52.76928
2011	6	77	127895.6	53.86364
2011	6	78	128242.0667	54.9888
2011	6	79	128586.0333	56.16597
2011	6	80	128875.2	57.20431
2011	6	81	129182.5667	58.35917
2011	6	82	129571.1	59.8983
2011	6	83	129959.3	61.52956
2011	6	84	130227.3667	62.71348
2011	6	85	130491.5	63.92814
2011	6	86	130669.0667	64.77254
2011	6	87	130831.2	65.56369
2011	6	88	130946.0667	66.13611
2011	6	89	131112.1333	66.98153
2011	6	90	131223.7667	67.56195
2011	6	91	131306	67.99584
2011	6	92	131364.4667	68.30765
2011	6	93	131461.2667	68.83001
2011	6	94	131543.9	69.28205
2011	6	95	131655.7	69.90273
2011	6	96	131735.2667	70.35093
2011	6	97	131832.3	70.90491
2011	6	98	132088.0667	72.40483
2011	6	99	132350.2	74.00377
2011	6	100	132577.3667	75.44186
2011	6	101	132779.1667	76.76166
2011	6	102	133007.9667	78.3078

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	103	133174.5333	79.46768
2011	6	104	133346.3	80.6949
2011	6	105	133395.5667	81.05284
2011	6	106	133519.0333	81.96174
2011	6	107	133606.2	82.61376
2011	6	108	133685.1667	83.21194
2011	6	109	133802.2	84.11178
2011	6	110	133887.1	84.77464
2011	6	111	134053.7667	86.10102
2011	6	112	134148.8333	86.87276
2011	6	113	134281.3667	87.96743
2011	6	114	134364.8	88.66794
2011	6	115	134530.1333	90.08259
2011	6	116	134672.5	91.32952
2011	6	117	134788.3	92.36384
2011	6	118	134862.8	93.03895
2011	6	119	134905.1333	93.42599
2011	6	120	135026.3333	94.54794
2011	6	121	135087.0333	95.11765
2011	6	122	135185.4	96.05211
2011	6	123	135211.9	96.30625
2011	6	124	135285.6333	97.01878
2011	6	125	135314.5333	97.30024
2011	6	126	135350.4	97.65127
2011	6	127	135450.8	98.64414
2011	6	128	135481.2667	98.94843
2011	6	129	135621.8667	100.3711
2011	6	130	135682.5333	100.9944
2011	6	131	135864.2333	102.89597
2011	6	132	136070	105.11373
2011	6	133	136162.8667	106.13758
2011	6	134	136286.5667	107.52399
2011	6	135	136397.3667	108.78813
2011	6	136	136569.6333	110.79629
2011	6	137	136709.6333	112.46747
2011	6	138	136982	115.82231
2011	6	139	137126.8333	117.66361
2011	6	140	137257.7	119.36255
2011	6	141	137358	120.68772
2011	6	142	137484.2333	122.38447
2011	6	143	137636.9333	124.48093
2011	6	144	137748.5667	126.04463
2011	6	145	137833.6667	127.25461
2011	6	146	137977.5333	129.33606
2011	6	147	138055.9667	130.49013
2011	6	148	138121.1667	131.46001
2011	6	149	138212.8	132.83943
2011	6	150	138289.0667	134.00225
2011	6	151	138390.0333	135.56254
2011	6	152	138464.3	136.7256
2011	6	153	138535.6333	137.85513

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	154	138634.5333	139.44156
2011	6	155	138717.1	140.78437
2011	6	156	138793	142.03369
2011	6	157	138883.4333	143.54117
2011	6	158	139022.3667	145.89784
2011	6	159	139093.7333	147.12787
2011	6	160	139209.1667	149.14586
2011	6	161	139285.1667	150.49392
2011	6	162	139350.0333	151.65689
2011	6	163	139429.7667	153.10217
2011	6	164	139481.9	154.05667
2011	6	165	139557.6667	155.45742
2011	6	166	139633.7333	156.88002
2011	6	167	139724.4667	158.59856
2011	6	168	139777.9333	159.62239
2011	6	169	139832.8	160.68171
2011	6	170	139955.3	163.07895
2011	6	171	140027	164.5029
2011	6	172	140062.9	165.22171
2011	6	173	140085.9667	165.68564
2011	6	174	140125.6333	166.48725
2011	6	175	140145.1667	166.88377
2011	6	176	140179.0333	167.57405
2011	6	177	140220.0667	168.41517
2011	6	178	140241.4	168.85454
2011	6	179	140282.5	169.70505
2011	6	180	140322.7333	170.54279
2011	6	181	140380.1333	171.74686
2011	6	182	140425.9	172.71446
2011	6	183	140505.3	174.40916
2011	6	184	140587.4667	176.18457
2011	6	185	140660.3	177.77694
2011	6	186	140708.5667	178.84196
2011	6	187	140781.9	180.47509
2011	6	188	140830.2333	181.56146
2011	6	189	140883.1	182.75889
2011	6	190	140967.8667	184.69905
2011	6	191	141077.7667	187.25193
2011	6	192	141161.7333	189.23133
2011	6	193	141310.6667	192.80493
2011	6	194	141353.9667	193.85915
2011	6	195	141388.0667	194.69428
2011	6	196	141427.9333	195.67614
2011	6	197	141460.5	196.48263
2011	6	198	141509.5333	197.70446
2011	6	199	142151.6	214.57252
2011	6	200	142176.7	215.26594
2011	6	201	142203.6667	216.01387
2011	6	202	142249.5667	217.294
2011	6	203	142935.6333	237.53092
2011	6	204	143013.2	239.95443

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	205	143025.0667	240.32772
2011	6	206	143046.7	241.00998
2011	6	207	143085.9667	242.25408
2011	6	208	143119.2333	243.31391
2011	6	209	143158.9667	244.58679
2011	6	210	143213.7333	246.35391
2011	6	211	143319.0333	249.79315
2011	6	212	143462.8333	254.57958
2011	6	213	143503.7	255.95903
2011	6	214	143538.6667	257.14614
2011	6	215	143587.6333	258.81919
2011	6	216	143638.8333	260.58189
2011	6	217	143681.3	262.05437
2011	6	218	143699.8667	262.70113
2011	6	219	143712.4333	263.13992
2011	6	220	143733.6333	263.88207
2011	6	221	143787.8667	265.79151
2011	6	222	143805.8	266.42638
2011	6	223	143830.4333	267.30126
2011	6	224	143853.5667	268.12585
2011	6	225	143866.5667	268.59051
2011	6	226	143911.3667	270.19884
2011	6	227	143954.3	271.75047
2011	6	228	143991.5333	273.10432
2011	6	229	144025.8333	274.35829
2011	6	230	144060.3	275.62496
2011	6	231	144076.6333	276.22754
2011	6	232	144099.9	277.0885
2011	6	233	144116.3333	277.69843
2011	6	234	144142.7667	278.68271
2011	6	235	144155.5667	279.16076
2011	6	236	144467.3667	291.0975
2011	6	237	144479.7333	291.58269
2011	6	238	144491.6333	292.05044
2011	6	239	144506.2333	292.62546
2011	6	240	144528.0667	293.48776
2011	6	241	144554.2	294.52365
2011	6	242	144575.2333	295.36038
2011	6	243	144585.9333	295.78706
2011	6	244	144592.4	296.04527
2011	6	245	144601.5333	296.41039
2011	6	246	144609.7	296.73729
2011	6	247	144630.2	297.55967
2011	6	248	144634.7667	297.74322
2011	6	249	144640.6333	297.9792
2011	6	250	144644.7667	298.14559
2011	6	251	144654.2667	298.5284
2011	6	252	144657.1667	298.64537
2011	6	253	144666.3	299.0141
2011	6	254	144675	299.36581
2011	6	255	144691.0667	300.01655

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	256	144735.5667	301.82721
2011	6	257	144741.3333	302.06275
2011	6	258	144759.2	302.79382
2011	6	259	144789.9	304.05465
2011	6	260	144818.7	305.2428
2011	6	261	144838.9667	306.08203
2011	6	262	144842.4333	306.22584
2011	6	263	144842.4333	306.22584
2011	6	264	144842.4333	306.22584
2011	6	265	144842.4333	306.22584
2011	6	266	144854.4333	306.72423
2011	6	267	144857.0333	306.83234
2011	6	268	144859.6333	306.94049
2011	6	269	144859.6333	306.94049
2011	6	270	144859.6667	306.94187
2011	6	271	144905.5	308.85536
2011	6	272	144905.5333	308.85676
2011	6	273	144910.7333	309.0747
2011	6	274	144915.9333	309.29281
2011	6	275	144924.7	309.66091
2011	6	276	144931.8667	309.96219
2011	6	277	144935.4	310.11085
2011	6	278	144949.7333	310.71473
2011	6	279	144977.5	311.88831
2011	6	280	144987.3333	312.30511
2011	6	281	145004.7667	313.04558
2011	6	282	145018.2333	313.61892
2011	6	283	145034.8333	314.32727
2011	6	284	145046.7	314.83473
2011	6	285	145051.4	315.03598
2011	6	286	145056.2	315.24165
2011	6	287	145068.6333	315.7751
2011	6	288	145073.4333	315.98131
2011	6	289	145097.0333	316.99738
2011	6	290	145101.7333	317.20017
2011	6	291	145112.6	317.66959
2011	6	292	145131.7	318.49654
2011	6	293	145139	318.81323
2011	6	294	145139.7667	318.84651
2011	6	295	145146.1	319.12159
2011	6	296	145157.8	319.63045
2011	6	297	145169.5	320.14021
2011	6	298	145173.4333	320.31179
2011	6	299	145178.0333	320.51258
2011	6	300	145197.8333	321.37845
2011	6	301	145198.5333	321.40911
2011	6	302	145198.8667	321.42371
2011	6	303	145198.8667	321.42371
2011	6	304	145200.3667	321.48942
2011	6	305	145201.0333	321.51863
2011	6	306	145205.1667	321.6998

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	307	145212.1667	322.00688
2011	6	308	145212.5	322.02151
2011	6	309	145213.2333	322.0537
2011	6	310	145214.9333	322.12834
2011	6	311	145214.9333	322.12834
2011	6	312	145214.9667	322.1298
2011	6	313	145217.1	322.2235
2011	6	314	145217.1	322.2235
2011	6	315	145217.1	322.2235
2011	6	316	145265.9	324.37499
2011	6	317	145265.9	324.37499
2011	6	318	145270.8333	324.59338
2011	6	319	145275.5333	324.8016
2011	6	320	145275.5333	324.8016
2011	6	321	145275.5333	324.8016
2011	6	322	145335.0333	327.45038
2011	6	323	145339.8	327.66361
2011	6	324	145339.8	327.66361
2011	6	325	145355.1667	328.35209
2011	6	326	145373.4667	329.1741
2011	6	327	145392.3333	330.02395
2011	6	328	145392.3333	330.02395
2011	6	329	145392.3333	330.02395
2011	6	330	145393.5	330.07658
2011	6	331	145401.8333	330.4528
2011	6	332	145401.8333	330.4528
2011	6	333	145411.0333	330.8687
2011	6	334	145436.5333	332.0245
2011	6	335	145442.2	332.28196
2011	6	336	145451.5333	332.70648
2011	6	337	145468.2	333.46606
2011	6	338	145483.3	334.15591
2011	6	339	145500.7333	334.95432
2011	6	340	145500.7333	334.95432
2011	6	341	145691.8	343.84475
2011	6	342	145698.8333	344.17696
2011	6	343	145708.7333	344.64518
2011	6	344	145711.6667	344.78405
2011	6	345	145734.2667	345.85603
2011	6	346	145756.7667	346.92694
2011	6	347	145774.9667	347.79586
2011	6	348	145834.3333	350.64697
2011	6	349	145849.3	351.36981
2011	6	350	145872.1	352.47415
2011	6	351	145890.1333	353.35032
2011	6	352	145890.1333	353.35032
2011	6	353	145901.0667	353.8827
2011	6	354	145932.1667	355.4019
2011	6	355	145941.7667	355.87231
2011	6	356	145949.6333	356.25829
2011	6	357	145950.5333	356.30247

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	358	145954.6333	356.50385
2011	6	359	145957.4	356.63981
2011	6	360	145970.6	357.28927
2011	6	361	145995.4333	358.51465
2011	6	362	146007.0333	359.08863
2011	6	363	146021.0333	359.78271
2011	6	364	146032.5667	360.35561
2011	6	365	146038.0333	360.62751
2011	6	366	146049.7667	361.21186
2011	6	367	146060.2	361.73234
2011	6	368	146088.3	363.13826
2011	6	369	146097.9333	363.62162
2011	6	370	146172.6333	367.39389
2011	6	371	146188.6	368.20576
2011	6	372	146198.4667	368.70844
2011	6	373	146290.1333	373.41481
2011	6	374	146307.1667	374.29658
2011	6	375	146354.0333	376.73455
2011	6	376	146405.5	379.43188
2011	6	377	146417.3	380.05329
2011	6	378	146519.5333	385.48395
2011	6	379	146551.6333	387.20657
2011	6	380	146561.9667	387.7629
2011	6	381	146599.5333	389.79277
2011	6	382	146649.4333	392.50703
2011	6	383	146671.7667	393.72851
2011	6	384	146693.3333	394.912
2011	6	385	146712.2333	395.95235
2011	6	386	146731.5333	397.01779
2011	6	387	146775.2667	399.44367
2011	6	388	146851.3667	403.70352
2011	6	389	146879.3667	405.2833
2011	6	390	146913.1667	407.19931
2011	6	391	146936.5333	408.52964
2011	6	392	146955.1667	409.59389
2011	6	393	146982	411.13177
2011	6	394	147014	412.97399
2011	6	395	147088.3333	417.28802
2011	6	396	147110.9667	418.61127
2011	6	397	147139.9333	420.31146
2011	6	398	147168.8667	422.01717
2011	6	399	147200	423.86097
2011	6	400	147227	425.46706
2011	6	401	147252.6	426.99597
2011	6	402	147298.3	429.74013
2011	6	403	147325.7333	431.3966
2011	6	404	147352.4333	433.01543
2011	6	405	147387.9333	435.178
2011	6	406	147407.8	436.39333
2011	6	407	147432.2667	437.8951
2011	6	408	147450.3	439.00557

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	409	147466.5667	440.00987
2011	6	410	147488.0667	441.34108
2011	6	411	147509.0333	442.64347
2011	6	412	147533.3	444.15602
2011	6	413	147553.8667	445.44233
2011	6	414	147583.7667	447.31955
2011	6	415	147605.1667	448.66836
2011	6	416	147625.3333	449.94346
2011	6	417	147658.8333	452.07024
2011	6	418	147688.7333	453.97763
2011	6	419	147706.4	455.10871
2011	6	420	147742.4	457.42296
2011	6	421	147769.2667	459.15835
2011	6	422	147783.7333	460.09572
2011	6	423	147884.5333	466.6846
2011	6	424	147898.9667	467.63633
2011	6	425	147926.2	469.43778
2011	6	426	147930.3	469.70964
2011	6	427	147939.9	470.34684
2011	6	428	147946.3333	470.77438
2011	6	429	147961.3	471.77063
2011	6	430	147968.7	472.26404
2011	6	431	147992.1	473.82795
2011	6	432	147999.4	474.31697
2011	6	433	148012.8333	475.21829
2011	6	434	148024.8667	476.02723
2011	6	435	148041.2667	477.1321
2011	6	436	148044.0333	477.31877
2011	6	437	148090.3	480.45197
2011	6	438	148105.2667	481.47024
2011	6	439	148118.7	482.38616
2011	6	440	148139.4	483.80121
2011	6	441	148154.7667	484.85456
2011	6	442	148174.3	486.19707
2011	6	443	148195.7	487.67246
2011	6	444	148238.2333	490.61912
2011	6	445	148253.2	491.66054
2011	6	446	148264.1	492.42047
2011	6	447	148282.5667	493.71082
2011	6	448	148300.5333	494.96971
2011	6	449	148312.4	495.80308
2011	6	450	148329.1667	496.98311
2011	6	451	148341.5667	497.85776
2011	6	452	148415.2667	503.0904
2011	6	453	148431.5	504.25085
2011	6	454	148463	506.51082
2011	6	455	148477.3	507.54035
2011	6	456	148495.7	508.86835
2011	6	457	148531.2667	511.44588
2011	6	458	148561.5667	513.65275
2011	6	459	148578.7	514.90514

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	460	148596.4	516.20238
2011	6	461	148615	517.56935
2011	6	462	148634.7333	519.02383
2011	6	463	148655.8	520.58141
2011	6	464	148678.7333	522.28268
2011	6	465	148683.9667	522.67174
2011	6	466	148710.5	524.64904
2011	6	467	148726.2667	525.82778
2011	6	468	148739.8	526.84181
2011	6	469	148757.2333	528.15113
2011	6	470	148769.2333	529.0544
2011	6	471	148780.7333	529.92158
2011	6	472	148788.2333	530.48794
2011	6	473	148795.9667	531.07261
2011	6	474	148803.7333	531.66049
2011	6	475	148823.0333	533.12435
2011	6	476	148835.1667	534.04684
2011	6	477	148938.6	541.98021
2011	6	478	148950.3333	542.88806
2011	6	479	148954.9333	543.24442
2011	6	480	148961.1333	543.72512
2011	6	481	148987.2	545.75111
2011	6	482	148992.5667	546.16922
2011	6	483	149002.9667	546.98044
2011	6	484	149004.8	547.12358
2011	6	485	149007.1	547.30321
2011	6	486	149025.6333	548.75294
2011	6	487	149041.2	549.97377
2011	6	488	149047	550.42938
2011	6	489	149051.4667	550.78052
2011	6	490	149065.9333	551.91945
2011	6	491	149078.2333	552.88977
2011	6	492	149090.7	553.87509
2011	6	493	149113.9667	555.719
2011	6	494	149162.8333	559.61302
2011	6	495	149178.7	560.88361
2011	6	496	149182.3333	561.17499
2011	6	497	149221.1667	564.29941
2011	6	498	149231.6	565.14199
2011	6	499	149254.2333	566.97442
2011	6	500	149263.6667	567.74002
2011	6	501	149451.4333	583.20944
2011	6	502	149458.1	583.76684
2011	6	503	149474.1	585.10689
2011	6	504	149478.9	585.50954
2011	6	505	149484.8667	586.01047
2011	6	506	149491.2333	586.54548
2011	6	507	149496.0333	586.94918
2011	6	508	149504.4	587.65355
2011	6	509	149520.9	589.04529
2011	6	510	149526.9333	589.55506

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	511	149527.4333	589.59732
2011	6	512	149544	590.99959
2011	6	513	149544	590.99959
2011	6	514	149545.5	591.12673
2011	6	515	149550.1	591.5168
2011	6	516	149550.1	591.5168
2011	6	517	149550.6333	591.56205
2011	6	518	149579.6333	594.0277
2011	6	519	149579.6333	594.0277
2011	6	520	149580.1333	594.07031
2011	6	521	149580.6333	594.11292
2011	6	522	149581.1667	594.15837
2011	6	523	149581.1667	594.15837
2011	6	524	149581.1667	594.15837
2011	6	525	149581.1667	594.15837
2011	6	526	149581.6667	594.20099
2011	6	527	149582.1667	594.24361
2011	6	528	149583.9	594.39138
2011	6	529	149585.4333	594.52214
2011	6	530	149585.4333	594.52214
2011	6	531	149585.4333	594.52214
2011	6	532	149621.8667	597.63798
2011	6	533	149621.8667	597.63798
2011	6	534	149621.8667	597.63798
2011	6	535	149621.8667	597.63798
2011	6	536	149621.8667	597.63798
2011	6	537	149621.8667	597.63798
2011	6	538	149621.8667	597.63798
2011	6	539	149621.8667	597.63798
2011	6	540	149621.9	597.64084
2011	6	541	149621.9	597.64084
2011	6	542	149621.9	597.64084
2011	6	543	149621.9	597.64084
2011	6	544	149621.9333	597.64369
2011	6	545	149727.4	606.76128
2011	6	546	149779.9667	611.3605
2011	6	547	149779.9667	611.3605
2011	6	548	149779.9667	611.3605
2011	6	549	149797.7667	612.92622
2011	6	550	149797.7667	612.92622
2011	6	551	149797.7667	612.92622
2011	6	552	149797.7667	612.92622
2011	6	553	149797.7667	612.92622
2011	6	554	149797.7667	612.92622
2011	6	555	149797.7667	612.92622
2011	6	556	149797.7667	612.92622
2011	6	557	149797.7667	612.92622
2011	6	558	149797.7667	612.92622
2011	6	559	149859.9667	618.43079
2011	6	560	149860	618.43376
2011	6	561	149860	618.43376

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	562	149860	618.43376
2011	6	563	149860	618.43376
2011	6	564	149865.1667	618.89334
2011	6	565	149865.1667	618.89334
2011	6	566	149885.9333	620.74422
2011	6	567	149885.9333	620.74422
2011	6	568	149925.3667	624.27493
2011	6	569	149930.6	624.74509
2011	6	570	149930.6	624.74509
2011	6	571	149935.7667	625.20963
2011	6	572	149940.9333	625.67454
2011	6	573	149979.4667	629.15336
2011	6	574	150005.0333	631.47281
2011	6	575	150040.7667	634.72972
2011	6	576	150045.7333	635.18381
2011	6	577	150050.9333	635.65959
2011	6	578	150055.8667	636.11133
2011	6	579	150060.7667	636.56035
2011	6	580	150065.9	637.03111
2011	6	581	150116.1	641.65416
2011	6	582	150130.8	643.01461
2011	6	583	150146	644.42453
2011	6	584	150161.4333	645.85942
2011	6	585	150161.4333	645.85942
2011	6	586	150176.3	647.24482
2011	6	587	150218.2	651.16628
2011	6	588	150223.0667	651.62338
2011	6	589	150224.3	651.73927
2011	6	590	150224.3	651.73927
2011	6	591	150239.0667	653.12854
2011	6	592	150239.0667	653.12854
2011	6	593	150239.0667	653.12854
2011	6	594	150239.0667	653.12854
2011	6	595	150239.0667	653.12854
2011	6	596	150247.4667	653.92022
2011	6	597	150248.1667	653.98623
2011	6	598	150248.9	654.0554
2011	6	599	150248.9	654.0554
2011	6	600	150263.4333	655.42782
2011	6	601	150268.5	655.90699
2011	6	602	150272.7	656.30447
2011	6	603	150277.8333	656.79063
2011	6	604	150285.0667	657.47632
2011	6	605	150293.2333	658.25139
2011	6	606	150301.0333	658.99255
2011	6	607	150317.8667	660.59508
2011	6	608	150326.8333	661.45037
2011	6	609	150334.6667	662.19852
2011	6	610	150357.7667	664.40994
2011	6	611	150368.6667	665.45613
2011	6	612	150380.8	666.62272

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	613	150393.4667	667.8429
2011	6	614	150426.8667	671.07158
2011	6	615	150438	672.15145
2011	6	616	150448.4333	673.16508
2011	6	617	150455.5	673.85255
2011	6	618	150460.8333	674.37188
2011	6	619	150465.8	674.85588
2011	6	620	150470.2	675.28497
2011	6	621	150474.2667	675.68181
2011	6	622	150485.6	676.78904
2011	6	623	150486.6667	676.89335
2011	6	624	150488.0667	677.03028
2011	6	625	150488.0667	677.03028
2011	6	626	150489.4667	677.16724
2011	6	627	150489.4667	677.16724
2011	6	628	150490.8667	677.30422
2011	6	629	150490.8667	677.30422
2011	6	630	150491.5667	677.37273
2011	6	631	150491.5667	677.37273
2011	6	632	150491.5667	677.37273
2011	6	633	150492.9667	677.50976
2011	6	634	150495.7667	677.78391
2011	6	635	150496.4667	677.85247
2011	6	636	150498.5667	678.05818
2011	6	637	150498.5667	678.05818
2011	6	638	150498.5667	678.05818
2011	6	639	150499.2667	678.12677
2011	6	640	150499.2667	678.12677
2011	6	641	150501.3667	678.33257
2011	6	642	150503.4667	678.53843
2011	6	643	150506.2667	678.81302
2011	6	644	150506.2667	678.81302
2011	6	645	150506.2667	678.81302
2011	6	646	150506.2667	678.81302
2011	6	647	150506.2667	678.81302
2011	6	648	150528.6333	681.01066
2011	6	649	150533.1667	681.457
2011	6	650	150533.8667	681.52594
2011	6	651	150533.8667	681.52594
2011	6	652	150537.7	681.90364
2011	6	653	150541.5333	682.28155
2011	6	654	150542.9333	682.41963
2011	6	655	150542.9333	682.41963
2011	6	656	150542.9333	682.41963
2011	6	657	150542.9333	682.41963
2011	6	658	150543.6333	682.48868
2011	6	659	150558.9667	684.00302
2011	6	660	150564.2	684.52068
2011	6	661	150566.4	684.73842
2011	6	662	150567.9667	684.89352
2011	6	663	150567.9667	684.89352

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	664	150575.4667	685.63654
2011	6	665	150594.1667	687.4928
2011	6	666	150605.6667	688.63698
2011	6	667	150609.6333	689.0321
2011	6	668	150624.9667	690.56171
2011	6	669	150624.9667	690.56171
2011	6	670	150632.8667	691.35118
2011	6	671	150632.8667	691.35118
2011	6	672	150636.6	691.72459
2011	6	673	150648.5333	692.9196
2011	6	674	150659.5667	694.02641
2011	6	675	150665	694.57213
2011	6	676	150678.6	695.9401
2011	6	677	150681	696.1818
2011	6	678	150688.1667	696.90407
2011	6	679	150697.4333	697.83915
2011	6	680	150706.2	698.72498
2011	6	681	150707.7667	698.88341
2011	6	682	150732.6333	701.4031
2011	6	683	150736.4667	701.79237
2011	6	684	150750.8667	703.25671
2011	6	685	150760.1	704.19733
2011	6	686	150767.7667	704.97936
2011	6	687	150777.2667	705.94966
2011	6	688	150777.2667	705.94966
2011	6	689	150791.9333	707.45041
2011	6	690	150795.9	707.85687
2011	6	691	150799.9	708.267
2011	6	692	150801.5	708.43112
2011	6	693	150831.1333	711.47797
2011	6	694	150834.9667	711.87311
2011	6	695	150836.5333	712.03467
2011	6	696	150846.9	713.10467
2011	6	697	150849.3	713.35263
2011	6	698	150855.5333	713.99705
2011	6	699	150867	715.18411
2011	6	700	150880.1	716.5428
2011	6	701	150896.5333	718.25102
2011	6	702	150896.5333	718.25102
2011	6	703	150916.8667	720.37056
2011	6	704	150916.8667	720.37056
2011	6	705	150925	721.22021
2011	6	706	150926.6	721.38748
2011	6	707	150928.2	721.55479
2011	6	708	150928.2	721.55479
2011	6	709	150945.8667	723.40486
2011	6	710	150945.8667	723.40486
2011	6	711	150952.5333	724.10429
2011	6	712	150964.2	725.33
2011	6	713	150964.2	725.33
2011	6	714	150971.8667	726.13665

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	715	150983.1667	727.3273
2011	6	716	150984.2	727.43628
2011	6	717	150987.1333	727.74574
2011	6	718	150992	728.25947
2011	6	719	150996.8667	728.77357
2011	6	720	151000.2	729.12592
2011	6	721	151007.8667	729.93699
2011	6	722	151043.0667	733.67302
2011	6	723	151043.0667	733.67302
2011	6	724	151054.5667	734.89794
2011	6	725	151060.6	735.54143
2011	6	726	151060.6	735.54143
2011	6	727	151060.6	735.54143
2011	6	728	151072.7333	736.83731
2011	6	729	151078.6333	737.46831
2011	6	730	151081.9667	737.82506
2011	6	731	151081.9667	737.82506
2011	6	732	151085.0667	738.157
2011	6	733	151085.0667	738.157
2011	6	734	151096.1	739.33969
2011	6	735	151096.1	739.33969
2011	6	736	151100.4667	739.80831
2011	6	737	151104.8333	740.27724
2011	6	738	151104.8333	740.27724
2011	6	739	151104.8333	740.27724
2011	6	740	151104.8333	740.27724
2011	6	741	151105.8667	740.38825
2011	6	742	151105.8667	740.38825
2011	6	743	151105.8667	740.38825
2011	6	744	151108.9667	740.7214
2011	6	745	151108.9667	740.7214
2011	6	746	151110.0333	740.83607
2011	6	747	151111.0667	740.94717
2011	6	748	151111.0667	740.94717
2011	6	749	151111.0667	740.94717
2011	6	750	151111.0667	740.94717
2011	6	751	151114.1667	741.28058
2011	6	752	151115.2	741.39175
2011	6	753	151115.2	741.39175
2011	6	754	151116.2333	741.50294
2011	6	755	151116.2333	741.50294
2011	6	756	151116.2333	741.50294
2011	6	757	151116.2333	741.50294
2011	6	758	151116.2333	741.50294
2011	6	759	151116.2333	741.50294
2011	6	760	151116.2333	741.50294
2011	6	761	151116.2333	741.50294
2011	6	762	151116.2333	741.50294
2011	6	763	151116.2333	741.50294
2011	6	764	151116.2333	741.50294
2011	6	765	151116.2333	741.50294

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	766	151116.2333	741.50294
2011	6	767	151116.2333	741.50294
2011	6	768	151116.2333	741.50294
2011	6	769	151116.2333	741.50294
2011	6	770	151116.2333	741.50294
2011	6	771	151116.2333	741.50294
2011	6	772	151116.2333	741.50294
2011	6	773	151116.2333	741.50294
2011	6	774	151116.2333	741.50294
2011	6	775	151116.2333	741.50294
2011	6	776	151116.2333	741.50294
2011	6	777	151116.2333	741.50294
2011	6	778	151116.2333	741.50294
2011	6	779	151116.2333	741.50294
2011	6	780	151116.2333	741.50294
2011	6	781	151116.2333	741.50294
2011	6	782	151116.2333	741.50294
2011	6	783	151116.2333	741.50294
2011	6	784	151116.2333	741.50294
2011	6	785	151116.2333	741.50294
2011	6	786	151116.2333	741.50294
2011	6	787	151116.2333	741.50294
2011	6	788	151116.2333	741.50294
2011	6	789	151116.2333	741.50294
2011	6	790	151116.2333	741.50294
2011	6	791	151116.2333	741.50294
2011	6	792	151116.2333	741.50294
2011	6	793	151139.5667	744.01831
2011	6	794	151139.5667	744.01831
2011	6	795	151139.5667	744.01831
2011	6	796	151141.2	744.19472
2011	6	797	151141.2	744.19472
2011	6	798	151142.8333	744.37117
2011	6	799	151142.8333	744.37117
2011	6	800	151142.8333	744.37117
2011	6	801	151143.2	744.41079
2011	6	802	151143.2	744.41079
2011	6	803	151144.8333	744.5873
2011	6	804	151146.8333	744.80349
2011	6	805	151148.4667	744.98009
2011	6	806	151152.4667	745.41278
2011	6	807	151154.4667	745.62922
2011	6	808	151156.1	745.80603
2011	6	809	151158.1	746.02259
2011	6	810	151163	746.55344
2011	6	811	151163.3667	746.59318
2011	6	812	151164.4667	746.71242
2011	6	813	151166.1	746.88949
2011	6	814	151168.1	747.10638
2011	6	815	151169.7333	747.28356
2011	6	816	151169.7333	747.28356

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	817	151170.1	747.32334
2011	6	818	151170.1	747.32334
2011	6	819	151170.1	747.32334
2011	6	820	151170.1	747.32334
2011	6	821	151171.2	747.44269
2011	6	822	151172.8333	747.61995
2011	6	823	151173.2	747.65975
2011	6	824	151173.5667	747.69955
2011	6	825	151173.5667	747.69955
2011	6	826	151173.5667	747.69955
2011	6	827	151173.5667	747.69955
2011	6	828	151173.9333	747.73936
2011	6	829	151174.3	747.77916
2011	6	830	151174.3	747.77916
2011	6	831	151174.3	747.77916
2011	6	832	151174.3	747.77916
2011	6	833	151174.3	747.77916
2011	6	834	151174.3	747.77916
2011	6	835	151174.3	747.77916
2011	6	836	151174.3	747.77916
2011	6	837	151174.3	747.77916
2011	6	838	151174.3	747.77916
2011	6	839	151174.3	747.77916
2011	6	840	151174.3	747.77916
2011	6	841	151180.8333	748.4888
2011	6	842	151180.8333	748.4888
2011	6	843	151180.8333	748.4888
2011	6	844	151180.8333	748.4888
2011	6	845	151180.8333	748.4888
2011	6	846	151182.4667	748.66632
2011	6	847	151182.4667	748.66632
2011	6	848	151182.4667	748.66632
2011	6	849	151182.4667	748.66632
2011	6	850	151182.4667	748.66632
2011	6	851	151182.4667	748.66632
2011	6	852	151182.4667	748.66632
2011	6	853	151182.4667	748.66632
2011	6	854	151182.4667	748.66632
2011	6	855	151182.4667	748.66632
2011	6	856	151182.4667	748.66632
2011	6	857	151182.4667	748.66632
2011	6	858	151182.4667	748.66632
2011	6	859	151182.4667	748.66632
2011	6	860	151182.4667	748.66632
2011	6	861	151182.4667	748.66632
2011	6	862	151182.4667	748.66632
2011	6	863	151182.4667	748.66632
2011	6	864	151182.4667	748.66632
2011	6	865	151182.4667	748.66632
2011	6	866	151182.4667	748.66632
2011	6	867	151182.4667	748.66632

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	868	151182.4667	748.66632
2011	6	869	151182.4667	748.66632
2011	6	870	151182.4667	748.66632
2011	6	871	151182.4667	748.66632
2011	6	872	151182.4667	748.66632
2011	6	873	151182.4667	748.66632
2011	6	874	151242.4667	755.21805
2011	6	875	151242.4667	755.21805
2011	6	876	151242.4667	755.21805
2011	6	877	151242.4667	755.21805
2011	6	878	151242.4667	755.21805
2011	6	879	151242.4667	755.21805
2011	6	880	151242.4667	755.21805
2011	6	881	151242.4667	755.21805
2011	6	882	151242.4667	755.21805
2011	6	883	151242.4667	755.21805
2011	6	884	151242.4667	755.21805
2011	6	885	151242.4667	755.21805
2011	6	886	151242.4667	755.21805
2011	6	887	151242.4667	755.21805
2011	6	888	151242.4667	755.21805
2011	6	889	151242.4667	755.21805
2011	6	890	151242.4667	755.21805
2011	6	891	151242.4667	755.21805
2011	6	892	151242.4667	755.21805
2011	6	893	151242.4667	755.21805
2011	6	894	151242.4667	755.21805
2011	6	895	151242.4667	755.21805
2011	6	896	151242.4667	755.21805
2011	6	897	151242.4667	755.21805
2011	6	898	151242.4667	755.21805
2011	6	899	151242.4667	755.21805
2011	6	900	151242.4667	755.21805
2011	6	901	151369.4667	769.2844
2011	6	902	151897.4667	830.76318
2011	6	903	151897.4667	830.76318
2011	6	904	151897.4667	830.76318
2011	6	905	151897.4667	830.76318
2011	6	906	151897.4667	830.76318
2011	6	907	151897.4667	830.76318
2011	6	908	151897.4667	830.76318
2011	6	909	151897.4667	830.76318
2011	6	910	151897.4667	830.76318
2011	6	911	151897.4667	830.76318
2011	6	912	151897.4667	830.76318
2011	6	913	151897.4667	830.76318
2011	6	914	151897.4667	830.76318
2011	6	915	151897.4667	830.76318
2011	6	916	151897.4667	830.76318
2011	6	917	151897.4667	830.76318
2011	6	918	151897.4667	830.76318

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	919	151897.4667	830.76318
2011	6	920	151897.4667	830.76318
2011	6	921	151897.4667	830.76318
2011	6	922	151897.4667	830.76318
2011	6	923	151897.4667	830.76318
2011	6	924	151897.4667	830.76318
2011	6	925	151897.4667	830.76318
2011	6	926	151897.4667	830.76318
2011	6	927	151897.4667	830.76318
2011	6	928	151897.4667	830.76318
2011	6	929	151897.4667	830.76318
2011	6	930	151897.4667	830.76318
2011	6	931	151897.4667	830.76318
2011	6	932	151897.4667	830.76318
2011	6	933	151897.4667	830.76318
2011	6	934	151897.4667	830.76318
2011	6	935	151897.4667	830.76318
2011	6	936	151897.4667	830.76318
2011	6	937	151897.4667	830.76318
2011	6	938	151897.4667	830.76318
2011	6	939	151897.4667	830.76318
2011	6	940	151897.4667	830.76318
2011	6	941	151897.4667	830.76318
2011	6	942	151897.4667	830.76318
2011	6	943	151897.4667	830.76318
2011	6	944	151897.4667	830.76318
2011	6	945	151897.4667	830.76318
2011	6	946	151897.4667	830.76318
2011	6	947	151897.4667	830.76318
2011	6	948	151897.4667	830.76318
2011	6	949	151897.4667	830.76318
2011	6	950	151897.4667	830.76318
2011	6	951	151897.4667	830.76318
2011	6	952	151897.4667	830.76318
2011	6	953	151897.4667	830.76318
2011	6	954	151897.4667	830.76318
2011	6	955	151897.4667	830.76318
2011	6	956	151897.4667	830.76318
2011	6	957	151897.4667	830.76318
2011	6	958	151897.4667	830.76318
2011	6	959	151897.4667	830.76318
2011	6	960	151897.4667	830.76318
2011	6	961	151897.4667	830.76318
2011	6	962	151897.4667	830.76318
2011	6	963	151897.4667	830.76318
2011	6	964	151897.4667	830.76318
2011	6	965	151897.4667	830.76318
2011	6	966	151897.4667	830.76318
2011	6	967	151897.4667	830.76318
2011	6	968	151897.4667	830.76318
2011	6	969	151897.4667	830.76318

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	6	970	151897.4667	830.76318
2011	6	971	151897.4667	830.76318
2011	6	972	151897.4667	830.76318
2011	6	973	151897.4667	830.76318
2011	6	974	151897.4667	830.76318
2011	6	975	151897.4667	830.76318
2011	6	976	151897.4667	830.76318
2011	6	977	151897.4667	830.76318
2011	6	978	151897.4667	830.76318
2011	6	979	151897.6667	830.78741
2011	6	980	151897.6667	830.78741
2011	6	981	151902.7	831.39755
2011	6	982	151902.7	831.39755
2011	6	983	151902.7	831.39755
2011	6	984	151902.9	831.4218
2011	6	985	151902.9	831.4218
2011	6	986	151902.9	831.4218
2011	6	987	151903.3	831.47031
2011	6	988	151903.3	831.47031
2011	6	989	151903.7	831.51882
2011	6	990	151903.7	831.51882
2011	6	991	151903.7	831.51882
2011	6	992	151903.7	831.51882
2011	6	993	151903.7	831.51882
2011	6	994	151903.7	831.51882
2011	6	995	151903.7	831.51882
2011	6	996	151903.8333	831.53499
2011	6	997	151903.8333	831.53499
2011	6	998	151960.2333	838.4049
2011	6	999	151962.3667	838.66591

July 2011

Net Benefit Tab

Effective_month	Test_result
July-2011	\$ 36.78

Fuel Ratios Tab

Coal_ratio	Gas_ratio	Oil_ratio
1.136980925	0.989607984	1.542233797

Curve Parameters Tab

a	b	c	d
3.020989738	0.000146513	16.58660469	34.8393663

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	1	19955.48387	34.83937
2011	7	2	20515.58065	34.83937
2011	7	3	20516	34.83937
2011	7	4	21740.77419	34.83937
2011	7	5	25170.87097	34.83937
2011	7	6	26745.90323	34.83937
2011	7	7	27922.87097	34.83937
2011	7	8	30546.32258	34.83937
2011	7	9	32226.25806	34.83937
2011	7	10	32248.93548	34.83937
2011	7	11	32249.19355	34.83937
2011	7	12	32256.3871	34.83937
2011	7	13	32337.6129	34.83937
2011	7	14	32360.3871	34.83937
2011	7	15	34723.3871	34.83937
2011	7	16	34730.22581	34.83937
2011	7	17	35029.25806	34.83937
2011	7	18	35589.06452	34.83937
2011	7	19	35814.58065	34.83937
2011	7	20	36456.77419	34.83937
2011	7	21	37075.12903	34.83937
2011	7	22	40886.96774	34.83938
2011	7	23	42189.93548	34.83938
2011	7	24	43300.19355	34.83938
2011	7	25	44451.58065	34.83938
2011	7	26	47548.58065	34.83939
2011	7	27	53132.25806	34.83943
2011	7	28	59350.83871	34.83954
2011	7	29	66246.96774	34.83988
2011	7	30	73168.12903	34.84096
2011	7	31	77738.12903	34.8427
2011	7	32	81143.70968	34.84517
2011	7	33	83966.35484	34.84854
2011	7	34	85996.32258	34.85213
2011	7	35	88369.77419	34.85813
2011	7	36	90473.03226	34.86578
2011	7	37	92421.77419	34.87562
2011	7	38	95234.19355	34.89662
2011	7	39	96765.83871	34.9128
2011	7	40	98440.29032	34.93577
2011	7	41	99823.77419	34.96007
2011	7	42	100909.9677	34.98338
2011	7	43	102333.129	35.02085
2011	7	44	104257.0968	35.08747
2011	7	45	105700.2903	35.15305
2011	7	46	107178.8065	35.23825
2011	7	47	108393.871	35.32534
2011	7	48	109532.7742	35.42415
2011	7	49	110477.5161	35.5212
2011	7	50	111651.129	35.66448
2011	7	51	112483.5161	35.784

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	52	113406.129	35.93681
2011	7	53	114200.7097	36.08809
2011	7	54	114780.871	36.21156
2011	7	55	115275.0323	36.3263
2011	7	56	115893.0968	36.48342
2011	7	57	116405.0323	36.62606
2011	7	58	117528.8387	36.98409
2011	7	59	118366.9355	37.29704
2011	7	60	119290.9355	37.69526
2011	7	61	119825.6774	37.95456
2011	7	62	120209.0645	38.15484
2011	7	63	120664.7097	38.40968
2011	7	64	121142.2258	38.69779
2011	7	65	121579.2581	38.98181
2011	7	66	122155.1613	39.38825
2011	7	67	122952.4839	40.0176
2011	7	68	123627.9677	40.61844
2011	7	69	124795.129	41.82553
2011	7	70	125488.6129	42.659
2011	7	71	126318.9677	43.78878
2011	7	72	127095.3871	44.9924
2011	7	73	127848.0323	46.31347
2011	7	74	128488.3871	47.57194
2011	7	75	129089.871	48.87946
2011	7	76	129563.2581	50.00228
2011	7	77	130251.5161	51.79685
2011	7	78	130649.4194	52.92968
2011	7	79	131308.4516	54.97484
2011	7	80	131739.9677	56.43764
2011	7	81	132166.6129	57.98838
2011	7	82	132516.6774	59.34358
2011	7	83	132819.129	60.57817
2011	7	84	133161.5161	62.05101
2011	7	85	133472	63.45934
2011	7	86	133803.8387	65.04522
2011	7	87	134067.3226	66.36678
2011	7	88	134361.3871	67.91011
2011	7	89	134689.5806	69.72194
2011	7	90	134899.3548	70.93168
2011	7	91	135062.2258	71.8998
2011	7	92	135219.4194	72.85879
2011	7	93	135401.0968	73.9981
2011	7	94	135535.0645	74.86004
2011	7	95	135701.6452	75.95831
2011	7	96	135811.8387	76.70133
2011	7	97	135914.3226	77.40442
2011	7	98	135980.2258	77.86277
2011	7	99	136037.9355	78.26818
2011	7	100	136133.5806	78.94853
2011	7	101	136193.2903	79.37865
2011	7	102	136259.9355	79.86369

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	103	136319.8387	80.30416
2011	7	104	136461.129	81.36023
2011	7	105	136589.129	82.33813
2011	7	106	136782.9677	83.85829
2011	7	107	136949.4516	85.20271
2011	7	108	137177.1613	87.10145
2011	7	109	137400.6129	89.03426
2011	7	110	137615.0968	90.95671
2011	7	111	137851.9677	93.15915
2011	7	112	137986.4839	94.44816
2011	7	113	138024.7742	94.82026
2011	7	114	138102.6774	95.5845
2011	7	115	138156.1935	96.11513
2011	7	116	138210	96.65332
2011	7	117	138278.8065	97.34843
2011	7	118	138332.9677	97.90109
2011	7	119	138526.0645	99.91149
2011	7	120	138555.2258	100.22062
2011	7	121	138652.0968	101.25809
2011	7	122	138793.7097	102.80445
2011	7	123	138843.8065	103.36007
2011	7	124	138975.6774	104.84444
2011	7	125	139185.5161	107.27301
2011	7	126	139294.9032	108.57223
2011	7	127	139322.2903	108.90114
2011	7	128	139444	110.3807
2011	7	129	139531.7742	111.46603
2011	7	130	139603.5484	112.3651
2011	7	131	139631.9355	112.72359
2011	7	132	139740.8387	114.11433
2011	7	133	139801.9677	114.90584
2011	7	134	139840.3226	115.40649
2011	7	135	139896.129	116.14053
2011	7	136	139932.8065	116.6266
2011	7	137	139999.3226	117.51554
2011	7	138	140055.7742	118.27755
2011	7	139	140188.8065	120.10117
2011	7	140	140289.4194	121.50681
2011	7	141	140335.2581	122.15487
2011	7	142	140415.1935	123.2966
2011	7	143	140493.0323	124.42273
2011	7	144	140592.0323	125.87574
2011	7	145	140659.6129	126.88113
2011	7	146	140763.6774	128.45104
2011	7	147	140870.9032	130.09666
2011	7	148	141011.3871	132.29655
2011	7	149	141145.0645	134.43701
2011	7	150	141274.8387	136.55993
2011	7	151	141347.8065	137.7734
2011	7	152	141410.6774	138.83055
2011	7	153	141481.7097	140.03801

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	154	141592.3226	141.94626
2011	7	155	141706.6452	143.95488
2011	7	156	141785.8387	145.36834
2011	7	157	141902.0968	147.47657
2011	7	158	142000.3548	149.28971
2011	7	159	142073.7097	150.66232
2011	7	160	142136.5484	151.85124
2011	7	161	142216.1613	153.37506
2011	7	162	142277.9677	154.57173
2011	7	163	142344.6452	155.87627
2011	7	164	142407.3871	157.11678
2011	7	165	142467.6774	158.3208
2011	7	166	142519.7742	159.37073
2011	7	167	142575.4839	160.50335
2011	7	168	142630.9355	161.64096
2011	7	169	142696.2581	162.9943
2011	7	170	142773.8065	164.61968
2011	7	171	142859.5161	166.44012
2011	7	172	142949.4194	168.37708
2011	7	173	143023.6452	169.99773
2011	7	174	143086.5484	171.38656
2011	7	175	143144.9032	172.68771
2011	7	176	143226.7419	174.53341
2011	7	177	143289.5806	175.96736
2011	7	178	143363.6129	177.67564
2011	7	179	143452.5806	179.75593
2011	7	180	143503.871	180.96897
2011	7	181	143539.4194	181.81566
2011	7	182	143577.129	182.71918
2011	7	183	143648.5161	184.44486
2011	7	184	143696.3871	185.61334
2011	7	185	143724.0323	186.29227
2011	7	186	143799	188.14884
2011	7	187	143834.5484	189.03712
2011	7	188	143897.871	190.63221
2011	7	189	143982.1613	192.78109
2011	7	190	144035.8065	194.16412
2011	7	191	144063.1935	194.87485
2011	7	192	144100.9355	195.8595
2011	7	193	144150.1935	197.15371
2011	7	194	144168.8387	197.64631
2011	7	195	144252.7419	199.88155
2011	7	196	144298.9677	201.12613
2011	7	197	144349	202.48377
2011	7	198	144427.4516	204.63492
2011	7	199	144588.7742	209.14555
2011	7	200	144624.7742	210.16836
2011	7	201	144706.6774	212.51776
2011	7	202	144755.8387	213.94305
2011	7	203	144790	214.94019
2011	7	204	144859.4839	216.98552

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	205	144962.5484	220.06219
2011	7	206	145023.1935	221.89679
2011	7	207	145124.9355	225.01553
2011	7	208	145180.0323	226.72609
2011	7	209	145241.9677	228.66734
2011	7	210	145252	228.98362
2011	7	211	145282.5484	229.9499
2011	7	212	145368.9355	232.70851
2011	7	213	145403.3548	233.81847
2011	7	214	145482.8387	236.40551
2011	7	215	145528.5484	237.90848
2011	7	216	145549.7097	238.60807
2011	7	217	145631.3548	241.3299
2011	7	218	145714.1935	244.12869
2011	7	219	145734.3871	244.81668
2011	7	220	145743.5806	245.13065
2011	7	221	145782.3226	246.4589
2011	7	222	145796.4839	246.9465
2011	7	223	145866.2581	249.36544
2011	7	224	145898.8065	250.50324
2011	7	225	145954.871	252.47728
2011	7	226	146047.0968	255.76394
2011	7	227	146074.0968	256.7355
2011	7	228	146109.0645	258.00013
2011	7	229	146165.7419	260.06522
2011	7	230	146178.9677	260.54985
2011	7	231	146239.2903	262.77353
2011	7	232	146263.5806	263.67512
2011	7	233	146333.3871	266.28605
2011	7	234	146357.6774	267.20153
2011	7	235	146371.9677	267.74181
2011	7	236	146405.3871	269.01023
2011	7	237	146422.2581	269.65318
2011	7	238	146439.3226	270.3053
2011	7	239	146468.6774	271.43134
2011	7	240	146492.6452	272.35472
2011	7	241	146504.4839	272.81215
2011	7	242	146525.0645	273.60945
2011	7	243	146558.6129	274.91486
2011	7	244	146626.4839	277.57766
2011	7	245	146654.2903	278.67711
2011	7	246	146691.7742	280.16708
2011	7	247	146717.9677	281.21367
2011	7	248	146779.0645	283.67223
2011	7	249	146803.2258	284.65124
2011	7	250	146840.3548	286.16323
2011	7	251	146873.4194	287.5174
2011	7	252	146916.2581	289.28273
2011	7	253	146952.7419	290.7959
2011	7	254	146986.0323	292.18448
2011	7	255	147000.1613	292.77609

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	256	147017.6774	293.51141
2011	7	257	147042.4839	294.55637
2011	7	258	147058.0645	295.21485
2011	7	259	147072.5161	295.82711
2011	7	260	147089.0968	296.53135
2011	7	261	147105.6774	297.23748
2011	7	262	147145.9355	298.95992
2011	7	263	147156.9677	299.43391
2011	7	264	147165.9032	299.81843
2011	7	265	147185.5484	300.66579
2011	7	266	147204.3871	301.48092
2011	7	267	147226.3548	302.43459
2011	7	268	147258.9677	303.85668
2011	7	269	147277.7419	304.67876
2011	7	270	147296.871	305.51896
2011	7	271	147313.7419	306.26215
2011	7	272	147333.9355	307.15439
2011	7	273	147341.871	307.50582
2011	7	274	147346.9032	307.72891
2011	7	275	147352.0645	307.95791
2011	7	276	147367.0323	308.6231
2011	7	277	147393.1935	309.78964
2011	7	278	147412.8065	310.66744
2011	7	279	147428.7097	311.38127
2011	7	280	147444.9677	312.11294
2011	7	281	147515.4194	315.30593
2011	7	282	147529.2258	315.93595
2011	7	283	147539	316.38283
2011	7	284	147541.8065	316.51128
2011	7	285	147565.5806	317.60171
2011	7	286	147568.2903	317.72626
2011	7	287	147578.0323	318.1745
2011	7	288	147589.0645	318.68297
2011	7	289	147601.1613	319.24155
2011	7	290	147621.6774	320.19141
2011	7	291	147634.3226	320.77844
2011	7	292	147637.1935	320.91189
2011	7	293	147661.6129	322.04947
2011	7	294	147668.0323	322.34927
2011	7	295	147671.9677	322.53322
2011	7	296	147675.7742	322.71125
2011	7	297	147687.5484	323.26263
2011	7	298	147709.4516	324.29117
2011	7	299	147716.2903	324.61306
2011	7	300	147735.3226	325.51076
2011	7	301	147750.871	326.24619
2011	7	302	147771.0645	327.20412
2011	7	303	147825.129	329.78434
2011	7	304	147853.129	331.12957
2011	7	305	147872.6452	332.07083
2011	7	306	147943.2581	335.50153

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	307	147949.4516	335.80432
2011	7	308	147958.0323	336.22432
2011	7	309	147961.1935	336.37921
2011	7	310	147967.7419	336.70029
2011	7	311	147985.9677	337.59575
2011	7	312	147997.9032	338.1836
2011	7	313	148002.4839	338.40951
2011	7	314	148028.8065	339.71095
2011	7	315	148064	341.45972
2011	7	316	148086.8387	342.59994
2011	7	317	148108.0968	343.66505
2011	7	318	148122.5484	344.39124
2011	7	319	148124.6452	344.49674
2011	7	320	148127.4516	344.63801
2011	7	321	148128.9032	344.71111
2011	7	322	148129.7097	344.75172
2011	7	323	148132.9032	344.91262
2011	7	324	148139.8387	345.26232
2011	7	325	148148	345.67433
2011	7	326	148152.8387	345.91886
2011	7	327	148154.2903	345.99226
2011	7	328	148173.7419	346.97746
2011	7	329	148191.0645	347.85746
2011	7	330	148214.0968	349.03135
2011	7	331	148227.4194	349.71237
2011	7	332	148242.4839	350.48422
2011	7	333	148254.4194	351.09709
2011	7	334	148268.0968	351.80087
2011	7	335	148285.1613	352.68114
2011	7	336	148296.4839	353.26655
2011	7	337	148301.4839	353.52541
2011	7	338	148306.5161	353.78616
2011	7	339	148310	353.9668
2011	7	340	148325.3871	354.76585
2011	7	341	148349.0968	356.001
2011	7	342	148358.9677	356.51664
2011	7	343	148359.0968	356.52338
2011	7	344	148369.7742	357.08209
2011	7	345	148374.5806	357.3339
2011	7	346	148374.6129	357.33559
2011	7	347	148387.6129	358.01768
2011	7	348	148404.0645	358.88292
2011	7	349	148408.9355	359.13955
2011	7	350	148417.3871	359.5853
2011	7	351	148422.5484	359.85782
2011	7	352	148428.5806	360.17661
2011	7	353	148441.9032	360.8818
2011	7	354	148469.4194	362.34311
2011	7	355	148487.7742	363.32152
2011	7	356	148507.3226	364.36678
2011	7	357	148531.0968	365.64247

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	358	148595.5806	369.12751
2011	7	359	148614.0323	370.13147
2011	7	360	148623.1613	370.6293
2011	7	361	148647.0645	371.9363
2011	7	362	148657.129	372.48814
2011	7	363	148659.8065	372.6351
2011	7	364	148682.1613	373.86458
2011	7	365	148737.9677	376.95343
2011	7	366	148782.9677	379.46464
2011	7	367	148792.0645	379.97451
2011	7	368	148817.871	381.42508
2011	7	369	148834.871	382.38397
2011	7	370	148835.871	382.44046
2011	7	371	148849.7097	383.22312
2011	7	372	148871.4839	384.45815
2011	7	373	148956.8065	389.33998
2011	7	374	148975.4516	390.41583
2011	7	375	149116.8065	398.67908
2011	7	376	149145.129	400.3577
2011	7	377	149155.3871	400.96758
2011	7	378	149174.0323	402.07872
2011	7	379	149177.0968	402.26167
2011	7	380	149198.9032	403.56612
2011	7	381	149289.1613	409.01478
2011	7	382	149305.4839	410.00869
2011	7	383	149320.3548	410.91651
2011	7	384	149337.9032	411.99061
2011	7	385	149347.4839	412.57831
2011	7	386	149367.7419	413.82401
2011	7	387	149381.6129	414.67933
2011	7	388	149409.0645	416.37776
2011	7	389	149447.7097	418.78161
2011	7	390	149459.7742	419.53516
2011	7	391	149476.0645	420.555
2011	7	392	149511.7419	422.798
2011	7	393	149534.3871	424.22844
2011	7	394	149603.2258	428.60928
2011	7	395	149631.4194	430.41769
2011	7	396	149691.5484	434.30232
2011	7	397	149705.8065	435.22904
2011	7	398	149731.9677	436.93502
2011	7	399	149768.0645	439.30084
2011	7	400	149844.5484	444.35977
2011	7	401	149881.4516	446.82327
2011	7	402	149924.0645	449.68636
2011	7	403	149987.9032	454.01286
2011	7	404	150061.2581	459.04002
2011	7	405	150146.9677	464.99032
2011	7	406	150236.0968	471.26655
2011	7	407	150274.6774	474.01161
2011	7	408	150310.871	476.60253

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	409	150379.5484	481.5609
2011	7	410	150395.3871	482.71229
2011	7	411	150416.6129	484.25996
2011	7	412	150438.6452	485.87209
2011	7	413	150474.0968	488.47827
2011	7	414	150498.129	490.25353
2011	7	415	150550.4194	494.14026
2011	7	416	150639.9032	500.86868
2011	7	417	150673.1613	503.39445
2011	7	418	150711.0645	506.28969
2011	7	419	150730.7419	507.7998
2011	7	420	150749.1613	509.21774
2011	7	421	150774.871	511.20401
2011	7	422	150801.5161	513.27133
2011	7	423	150822.5161	514.90698
2011	7	424	150882.8065	519.63402
2011	7	425	150897	520.75361
2011	7	426	150915.0968	522.18483
2011	7	427	150931.129	523.45631
2011	7	428	150945.1613	524.57189
2011	7	429	150962.1935	525.92939
2011	7	430	150981.3226	527.4585
2011	7	431	151026.2258	531.06665
2011	7	432	151063.4839	534.08052
2011	7	433	151088.129	536.08417
2011	7	434	151108.5161	537.74772
2011	7	435	151125.1935	539.11266
2011	7	436	151155.4516	541.59857
2011	7	437	151179.4516	543.57904
2011	7	438	151206.4516	545.81633
2011	7	439	151267.7742	550.93429
2011	7	440	151289.3548	552.74757
2011	7	441	151310.871	554.56178
2011	7	442	151322.9032	555.57909
2011	7	443	151335.8065	556.67225
2011	7	444	151351.0968	557.97061
2011	7	445	151364.6452	559.12376
2011	7	446	151373.6129	559.88843
2011	7	447	151376.1935	560.10869
2011	7	448	151392.3548	561.49015
2011	7	449	151404.1613	562.50165
2011	7	450	151410.871	563.07736
2011	7	451	151417.7419	563.66757
2011	7	452	151423	564.11967
2011	7	453	151424.0645	564.21124
2011	7	454	151448.2581	566.29681
2011	7	455	151466.6452	567.88733
2011	7	456	151474.4839	568.56684
2011	7	457	151487.7097	569.71531
2011	7	458	151495.3226	570.3775
2011	7	459	151502.8065	571.02926

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	460	151511.5806	571.79441
2011	7	461	151523.0968	572.80032
2011	7	462	151576.6452	577.50248
2011	7	463	151604.4194	579.95754
2011	7	464	151632.3226	582.43519
2011	7	465	151654.4839	584.411
2011	7	466	151662.5806	585.13466
2011	7	467	151671.1613	585.9026
2011	7	468	151676.129	586.34769
2011	7	469	151697.1613	588.23607
2011	7	470	151709.3548	589.33383
2011	7	471	151714.5484	589.80205
2011	7	472	151724.7097	590.71928
2011	7	473	151733.871	591.54755
2011	7	474	151743.6452	592.43259
2011	7	475	151756.0968	593.56211
2011	7	476	151770.5806	594.87885
2011	7	477	151789.2258	596.57847
2011	7	478	151796.4839	597.24148
2011	7	479	151809.5806	598.43983
2011	7	480	151819.5484	599.35359
2011	7	481	151843.6129	601.56572
2011	7	482	151857.6129	602.85665
2011	7	483	151879.1935	604.85236
2011	7	484	151915.8387	608.25726
2011	7	485	151921.7097	608.80465
2011	7	486	151936.2581	610.16335
2011	7	487	151960.5806	612.44207
2011	7	488	152008.7742	616.98388
2011	7	489	152139.7742	629.51076
2011	7	490	152152.4194	630.73413
2011	7	491	152169.129	632.35458
2011	7	492	152176.1613	633.03786
2011	7	493	152194.5484	634.82813
2011	7	494	152215.7097	636.89513
2011	7	495	152243.0645	639.57767
2011	7	496	152258.4194	641.08867
2011	7	497	152268.5161	642.0843
2011	7	498	152278.9677	643.11665
2011	7	499	152288.9032	644.09964
2011	7	500	152298.0645	645.00745
2011	7	501	152313.4516	646.53522
2011	7	502	152321.0968	647.29572
2011	7	503	152350.871	650.26654
2011	7	504	152355.7742	650.75715
2011	7	505	152365.9032	651.7719
2011	7	506	152381.6129	653.34903
2011	7	507	152397.7097	654.96921
2011	7	508	152408.4516	656.05277
2011	7	509	152416.4194	656.85772
2011	7	510	152418.4516	657.0632

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	511	152449.871	660.24859
2011	7	512	152467.5484	662.04794
2011	7	513	152469.5161	662.24855
2011	7	514	152474.9032	662.7981
2011	7	515	152482.6774	663.59201
2011	7	516	152492.5806	664.60479
2011	7	517	152496.7097	665.02754
2011	7	518	152504.129	665.78788
2011	7	519	152517.129	667.12234
2011	7	520	152528.3226	668.27362
2011	7	521	152549.3871	670.44585
2011	7	522	152553.871	670.9092
2011	7	523	152576.129	673.21429
2011	7	524	152580.4839	673.66626
2011	7	525	152583.4516	673.97446
2011	7	526	152596.3871	675.31951
2011	7	527	152602.4516	675.95109
2011	7	528	152612	676.94675
2011	7	529	152612.6452	677.01408
2011	7	530	152630.7419	678.90556
2011	7	531	152630.7419	678.90556
2011	7	532	152643.6452	680.25761
2011	7	533	152650.9032	681.01939
2011	7	534	152652.871	681.22607
2011	7	535	152653.3548	681.2769
2011	7	536	152655.8065	681.53452
2011	7	537	152725.5161	688.90277
2011	7	538	152727.0323	689.06395
2011	7	539	152727.5484	689.11883
2011	7	540	152728.0645	689.17372
2011	7	541	152728.5484	689.22518
2011	7	542	152729.9355	689.37271
2011	7	543	152729.9355	689.37271
2011	7	544	152729.9355	689.37271
2011	7	545	152737.0323	690.12807
2011	7	546	152737.8387	690.21396
2011	7	547	152749	691.40385
2011	7	548	152749	691.40385
2011	7	549	152761.7419	692.7649
2011	7	550	152769.871	693.63468
2011	7	551	152769.871	693.63468
2011	7	552	152769.871	693.63468
2011	7	553	152769.871	693.63468
2011	7	554	152769.871	693.63468
2011	7	555	152772.3871	693.90413
2011	7	556	152778.4516	694.55403
2011	7	557	152787.5484	695.53009
2011	7	558	152787.5484	695.53009
2011	7	559	152811.3548	698.09128
2011	7	560	152817.7097	698.77664
2011	7	561	152817.7097	698.77664

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	562	152817.7097	698.77664
2011	7	563	152817.7097	698.77664
2011	7	564	152817.7097	698.77664
2011	7	565	152817.7097	698.77664
2011	7	566	152817.7097	698.77664
2011	7	567	152817.7097	698.77664
2011	7	568	152817.7097	698.77664
2011	7	569	152817.7097	698.77664
2011	7	570	152817.7097	698.77664
2011	7	571	152817.7097	698.77664
2011	7	572	152817.7097	698.77664
2011	7	573	152817.7097	698.77664
2011	7	574	152817.7097	698.77664
2011	7	575	152817.7097	698.77664
2011	7	576	152817.7097	698.77664
2011	7	577	152817.7097	698.77664
2011	7	578	152817.7097	698.77664
2011	7	579	152817.7097	698.77664
2011	7	580	152817.7097	698.77664
2011	7	581	152817.7097	698.77664
2011	7	582	152817.7419	698.78012
2011	7	583	152817.7742	698.7836
2011	7	584	152839.4516	701.12683
2011	7	585	152839.4516	701.12683
2011	7	586	152839.4516	701.12683
2011	7	587	152839.4516	701.12683
2011	7	588	152839.4516	701.12683
2011	7	589	152855.5161	702.86866
2011	7	590	152855.5161	702.86866
2011	7	591	152855.5161	702.86866
2011	7	592	152855.5161	702.86866
2011	7	593	152855.5161	702.86866
2011	7	594	152855.5161	702.86866
2011	7	595	152855.5161	702.86866
2011	7	596	152855.5161	702.86866
2011	7	597	152855.5161	702.86866
2011	7	598	152855.5161	702.86866
2011	7	599	152880.2903	705.56378
2011	7	600	152880.2903	705.56378
2011	7	601	152880.2903	705.56378
2011	7	602	152880.2903	705.56378
2011	7	603	152880.2903	705.56378
2011	7	604	152889.7742	706.59838
2011	7	605	152903.9355	708.14622
2011	7	606	152904	708.15328
2011	7	607	152904.0323	708.15681
2011	7	608	152904.0323	708.15681
2011	7	609	152935.0323	711.55764
2011	7	610	152945.0645	712.6619
2011	7	611	152945.0968	712.66545
2011	7	612	152964.5806	714.81522

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	613	153018.4194	720.79106
2011	7	614	153052.6129	724.61362
2011	7	615	153052.6129	724.61362
2011	7	616	153071.8387	726.77225
2011	7	617	153105.0645	730.51872
2011	7	618	153119.2258	732.12167
2011	7	619	153143.6129	734.89078
2011	7	620	153153	735.95959
2011	7	621	153153	735.95959
2011	7	622	153153	735.95959
2011	7	623	153153	735.95959
2011	7	624	153162.7419	737.07053
2011	7	625	153163.4194	737.14785
2011	7	626	153163.4194	737.14785
2011	7	627	153163.4194	737.14785
2011	7	628	153164.0968	737.22517
2011	7	629	153189.0968	740.08479
2011	7	630	153189.129	740.08848
2011	7	631	153193	740.53231
2011	7	632	153193.0323	740.536
2011	7	633	153193.0323	740.536
2011	7	634	153193.0323	740.536
2011	7	635	153193.0323	740.536
2011	7	636	153193.0323	740.536
2011	7	637	153193.0323	740.536
2011	7	638	153193.0323	740.536
2011	7	639	153193.0323	740.536
2011	7	640	153193.0323	740.536
2011	7	641	153193.0323	740.536
2011	7	642	153193.7097	740.6137
2011	7	643	153193.7097	740.6137
2011	7	644	153194.0645	740.6544
2011	7	645	153197.7742	741.08007
2011	7	646	153200.5484	741.39856
2011	7	647	153204	741.79502
2011	7	648	153207.4516	742.19171
2011	7	649	153211.7419	742.68509
2011	7	650	153219.4839	743.57628
2011	7	651	153223.3226	744.01858
2011	7	652	153229.6129	744.74395
2011	7	653	153234.871	745.35086
2011	7	654	153242.0323	746.17827
2011	7	655	153252.8387	747.42868
2011	7	656	153264.6452	748.7973
2011	7	657	153277.6129	750.30358
2011	7	658	153291.2258	751.88821
2011	7	659	153308.0645	753.85321
2011	7	660	153321.9032	755.47214
2011	7	661	153334.0968	756.90164
2011	7	662	153346.6129	758.37191
2011	7	663	153354.9355	759.35122

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	664	153361.7097	760.14931
2011	7	665	153367.6774	760.85311
2011	7	666	153372.3548	761.40522
2011	7	667	153376	761.83578
2011	7	668	153378.3226	762.11025
2011	7	669	153379.3871	762.23608
2011	7	670	153379.7097	762.27422
2011	7	671	153380.3871	762.35431
2011	7	672	153380.3871	762.35431
2011	7	673	153381.7419	762.51452
2011	7	674	153381.7419	762.51452
2011	7	675	153381.7419	762.51452
2011	7	676	153382.4194	762.59464
2011	7	677	153383.0968	762.67476
2011	7	678	153383.7742	762.7549
2011	7	679	153386.4839	763.07553
2011	7	680	153390.871	763.59494
2011	7	681	153393.5806	763.91594
2011	7	682	153397.2903	764.35563
2011	7	683	153406.8387	765.48858
2011	7	684	153408.1935	765.64948
2011	7	685	153423.0323	767.41403
2011	7	686	153423.7097	767.49469
2011	7	687	153426.5161	767.82894
2011	7	688	153426.5161	767.82894
2011	7	689	153427.871	767.99035
2011	7	690	153427.871	767.99035
2011	7	691	153429.9032	768.23254
2011	7	692	153429.9032	768.23254
2011	7	693	153429.9032	768.23254
2011	7	694	153435.9677	768.95574
2011	7	695	153435.9677	768.95574
2011	7	696	153435.9677	768.95574
2011	7	697	153441.1935	769.57949
2011	7	698	153441.1935	769.57949
2011	7	699	153441.1935	769.57949
2011	7	700	153448.6129	770.46597
2011	7	701	153450.129	770.64725
2011	7	702	153463.129	772.20349
2011	7	703	153466.8387	772.64818
2011	7	704	153466.8387	772.64818
2011	7	705	153472.871	773.37186
2011	7	706	153497.6129	776.34754
2011	7	707	153503.6452	777.07485
2011	7	708	153514.7742	778.41854
2011	7	709	153520.0323	779.05424
2011	7	710	153523.7419	779.50306
2011	7	711	153528.9677	780.13578
2011	7	712	153534.1935	780.76903
2011	7	713	153539.4516	781.40673
2011	7	714	153542.4839	781.77473

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	715	153553.6129	783.12694
2011	7	716	153558.1613	783.68028
2011	7	717	153570.2581	785.15394
2011	7	718	153585.9355	787.06811
2011	7	719	153588.9677	787.4389
2011	7	720	153605.3226	789.44197
2011	7	721	153610.6774	790.09897
2011	7	722	153615.3226	790.66936
2011	7	723	153621.4194	791.41865
2011	7	724	153626	791.98209
2011	7	725	153643.7742	794.1724
2011	7	726	153649.1935	794.84148
2011	7	727	153658.4839	795.98985
2011	7	728	153663.129	796.56469
2011	7	729	153670.0968	797.42776
2011	7	730	153677.8387	798.38787
2011	7	731	153692.4839	800.20739
2011	7	732	153713.9032	802.87635
2011	7	733	153723.0323	804.0167
2011	7	734	153725.3548	804.3071
2011	7	735	153732.3226	805.17894
2011	7	736	153745.2903	806.80416
2011	7	737	153746.8387	806.99845
2011	7	738	153750.5484	807.46413
2011	7	739	153754.2581	807.93008
2011	7	740	153757.0968	808.28683
2011	7	741	153760.8065	808.75328
2011	7	742	153775.6452	810.62191
2011	7	743	153779.3548	811.08977
2011	7	744	153794.1935	812.96403
2011	7	745	153794.1935	812.96403
2011	7	746	153797.9032	813.4333
2011	7	747	153805.3226	814.3727
2011	7	748	153805.3226	814.3727
2011	7	749	153809.0323	814.84282
2011	7	750	153816.7419	815.82077
2011	7	751	153819.1935	816.132
2011	7	752	153829.8387	817.48486
2011	7	753	153830.8387	817.61206
2011	7	754	153830.8387	817.61206
2011	7	755	153848.4194	819.85182
2011	7	756	153848.4194	819.85182
2011	7	757	153858.0968	821.08744
2011	7	758	153871.2258	822.76688
2011	7	759	153874.0645	823.13048
2011	7	760	153883.7419	824.37127
2011	7	761	153889.8065	825.14982
2011	7	762	153893.0323	825.56426
2011	7	763	153896.2581	825.97891
2011	7	764	153896.2581	825.97891
2011	7	765	153905.9355	827.22418

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	766	153915.6129	828.47141
2011	7	767	153915.6129	828.47141
2011	7	768	153915.6129	828.47141
2011	7	769	153916.6129	828.60041
2011	7	770	153917.6129	828.72942
2011	7	771	153917.6129	828.72942
2011	7	772	153918.6129	828.85845
2011	7	773	153919.6129	828.98751
2011	7	774	153919.6129	828.98751
2011	7	775	153922.6129	829.3748
2011	7	776	153926.6129	829.89148
2011	7	777	153929.6129	830.27921
2011	7	778	153930.6129	830.4085
2011	7	779	153932.6129	830.66714
2011	7	780	153933.6129	830.79648
2011	7	781	153934.6129	830.92585
2011	7	782	153934.6129	830.92585
2011	7	783	153938.6129	831.44355
2011	7	784	153940.6129	831.70252
2011	7	785	153940.6129	831.70252
2011	7	786	153940.6129	831.70252
2011	7	787	153940.6129	831.70252
2011	7	788	153940.6129	831.70252
2011	7	789	153940.6129	831.70252
2011	7	790	153940.6129	831.70252
2011	7	791	153940.6129	831.70252
2011	7	792	153940.6129	831.70252
2011	7	793	153979.3226	836.73149
2011	7	794	153979.3226	836.73149
2011	7	795	153979.3226	836.73149
2011	7	796	153979.3226	836.73149
2011	7	797	153979.3226	836.73149
2011	7	798	153979.3226	836.73149
2011	7	799	153979.3226	836.73149
2011	7	800	153979.3226	836.73149
2011	7	801	153979.3226	836.73149
2011	7	802	153979.3226	836.73149
2011	7	803	153979.3226	836.73149
2011	7	804	153979.3226	836.73149
2011	7	805	153979.3226	836.73149
2011	7	806	153979.3226	836.73149
2011	7	807	153979.3226	836.73149
2011	7	808	153979.3226	836.73149
2011	7	809	153979.3226	836.73149
2011	7	810	153979.3226	836.73149
2011	7	811	153979.3226	836.73149
2011	7	812	153979.3226	836.73149
2011	7	813	153979.3226	836.73149
2011	7	814	153979.3226	836.73149
2011	7	815	153979.3226	836.73149
2011	7	816	153979.3226	836.73149

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	817	153979.3226	836.73149
2011	7	818	153979.3226	836.73149
2011	7	819	153979.3226	836.73149
2011	7	820	153979.3226	836.73149
2011	7	821	153979.3226	836.73149
2011	7	822	153979.3226	836.73149
2011	7	823	153979.3226	836.73149
2011	7	824	153979.3226	836.73149
2011	7	825	153979.3226	836.73149
2011	7	826	153979.3226	836.73149
2011	7	827	153979.3226	836.73149
2011	7	828	153979.3226	836.73149
2011	7	829	153979.3226	836.73149
2011	7	830	153979.3226	836.73149
2011	7	831	153979.3226	836.73149
2011	7	832	153987.7097	837.82528
2011	7	833	153987.7097	837.82528
2011	7	834	153987.7097	837.82528
2011	7	835	153987.7097	837.82528
2011	7	836	153987.7097	837.82528
2011	7	837	153988.0645	837.87159
2011	7	838	153989.5806	838.06948
2011	7	839	153989.5806	838.06948
2011	7	840	153989.5806	838.06948
2011	7	841	153989.5806	838.06948
2011	7	842	153991.3226	838.29691
2011	7	843	153991.3226	838.29691
2011	7	844	153991.3226	838.29691
2011	7	845	153991.3226	838.29691
2011	7	846	153995.9677	838.9037
2011	7	847	153995.9677	838.9037
2011	7	848	154002.3548	839.73878
2011	7	849	154002.3548	839.73878
2011	7	850	154005.8387	840.19464
2011	7	851	154005.8387	840.19464
2011	7	852	154006.4194	840.27065
2011	7	853	154006.7742	840.3171
2011	7	854	154009.6774	840.69724
2011	7	855	154010.0323	840.74371
2011	7	856	154010.0323	840.74371
2011	7	857	154010.7419	840.83667
2011	7	858	154011.0968	840.88315
2011	7	859	154011.0968	840.88315
2011	7	860	154011.0968	840.88315
2011	7	861	154011.0968	840.88315
2011	7	862	154013.5806	841.2086
2011	7	863	154013.9355	841.2551
2011	7	864	154015	841.39463
2011	7	865	154015.3548	841.44115
2011	7	866	154015.7097	841.48766
2011	7	867	154016.0645	841.53418

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	868	154017.129	841.67376
2011	7	869	154017.129	841.67376
2011	7	870	154017.4839	841.72029
2011	7	871	154017.4839	841.72029
2011	7	872	154017.8387	841.76682
2011	7	873	154017.8387	841.76682
2011	7	874	154018.1935	841.81336
2011	7	875	154018.1935	841.81336
2011	7	876	154018.1935	841.81336
2011	7	877	154120.8387	855.3882
2011	7	878	154120.8387	855.3882
2011	7	879	154120.8387	855.3882
2011	7	880	154120.8387	855.3882
2011	7	881	154120.8387	855.3882
2011	7	882	154120.8387	855.3882
2011	7	883	154120.8387	855.3882
2011	7	884	154120.8387	855.3882
2011	7	885	154120.8387	855.3882
2011	7	886	154120.8387	855.3882
2011	7	887	154120.8387	855.3882
2011	7	888	154120.8387	855.3882
2011	7	889	154120.8387	855.3882
2011	7	890	154120.8387	855.3882
2011	7	891	154120.8387	855.3882
2011	7	892	154120.8387	855.3882
2011	7	893	154120.8387	855.3882
2011	7	894	154120.8387	855.3882
2011	7	895	154120.8387	855.3882
2011	7	896	154120.8387	855.3882
2011	7	897	154120.8387	855.3882
2011	7	898	154120.8387	855.3882
2011	7	899	154120.8387	855.3882
2011	7	900	154120.8387	855.3882
2011	7	901	154120.8387	855.3882
2011	7	902	154120.8387	855.3882
2011	7	903	154120.8387	855.3882
2011	7	904	154120.8387	855.3882
2011	7	905	154120.8387	855.3882
2011	7	906	154120.8387	855.3882
2011	7	907	154120.8387	855.3882
2011	7	908	154120.8387	855.3882
2011	7	909	154120.8387	855.3882
2011	7	910	154120.8387	855.3882
2011	7	911	154120.8387	855.3882
2011	7	912	154120.8387	855.3882
2011	7	913	154120.8387	855.3882
2011	7	914	154120.8387	855.3882
2011	7	915	154120.8387	855.3882
2011	7	916	154120.8387	855.3882
2011	7	917	154120.8387	855.3882
2011	7	918	154120.8387	855.3882

Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	919	154120.8387	855.3882
2011	7	920	154120.8387	855.3882
2011	7	921	154120.8387	855.3882
2011	7	922	154120.8387	855.3882
2011	7	923	154120.8387	855.3882
2011	7	924	154120.8387	855.3882
2011	7	925	154120.8387	855.3882
2011	7	926	154120.8387	855.3882
2011	7	927	154120.8387	855.3882
2011	7	928	154120.8387	855.3882
2011	7	929	154120.8387	855.3882
2011	7	930	154120.8387	855.3882
2011	7	931	154120.8387	855.3882
2011	7	932	154120.8387	855.3882
2011	7	933	154120.8387	855.3882
2011	7	934	154120.8387	855.3882
2011	7	935	154120.8387	855.3882
2011	7	936	154120.8387	855.3882
2011	7	937	154120.8387	855.3882
2011	7	938	154120.8387	855.3882
2011	7	939	154120.8387	855.3882
2011	7	940	154120.8387	855.3882
2011	7	941	154120.8387	855.3882
2011	7	942	154120.8387	855.3882
2011	7	943	154120.8387	855.3882
2011	7	944	154120.8387	855.3882
2011	7	945	154120.8387	855.3882
2011	7	946	154120.8387	855.3882
2011	7	947	154120.8387	855.3882
2011	7	948	154120.8387	855.3882
2011	7	949	154120.8387	855.3882
2011	7	950	154163.7419	861.12961
2011	7	951	154163.7419	861.12961
2011	7	952	154163.7419	861.12961
2011	7	953	154163.7419	861.12961
2011	7	954	154163.7419	861.12961
2011	7	955	154163.7419	861.12961
2011	7	956	154163.7419	861.12961
2011	7	957	154163.7419	861.12961
2011	7	958	154163.7419	861.12961
2011	7	959	154163.7419	861.12961
2011	7	960	154223.7419	869.22639
2011	7	961	154223.7419	869.22639
2011	7	962	154223.7419	869.22639
2011	7	963	154223.7419	869.22639
2011	7	964	154223.7419	869.22639
2011	7	965	154223.7419	869.22639
2011	7	966	154223.7419	869.22639
2011	7	967	154223.7419	869.22639
2011	7	968	154223.7419	869.22639
2011	7	969	154223.7419	869.22639

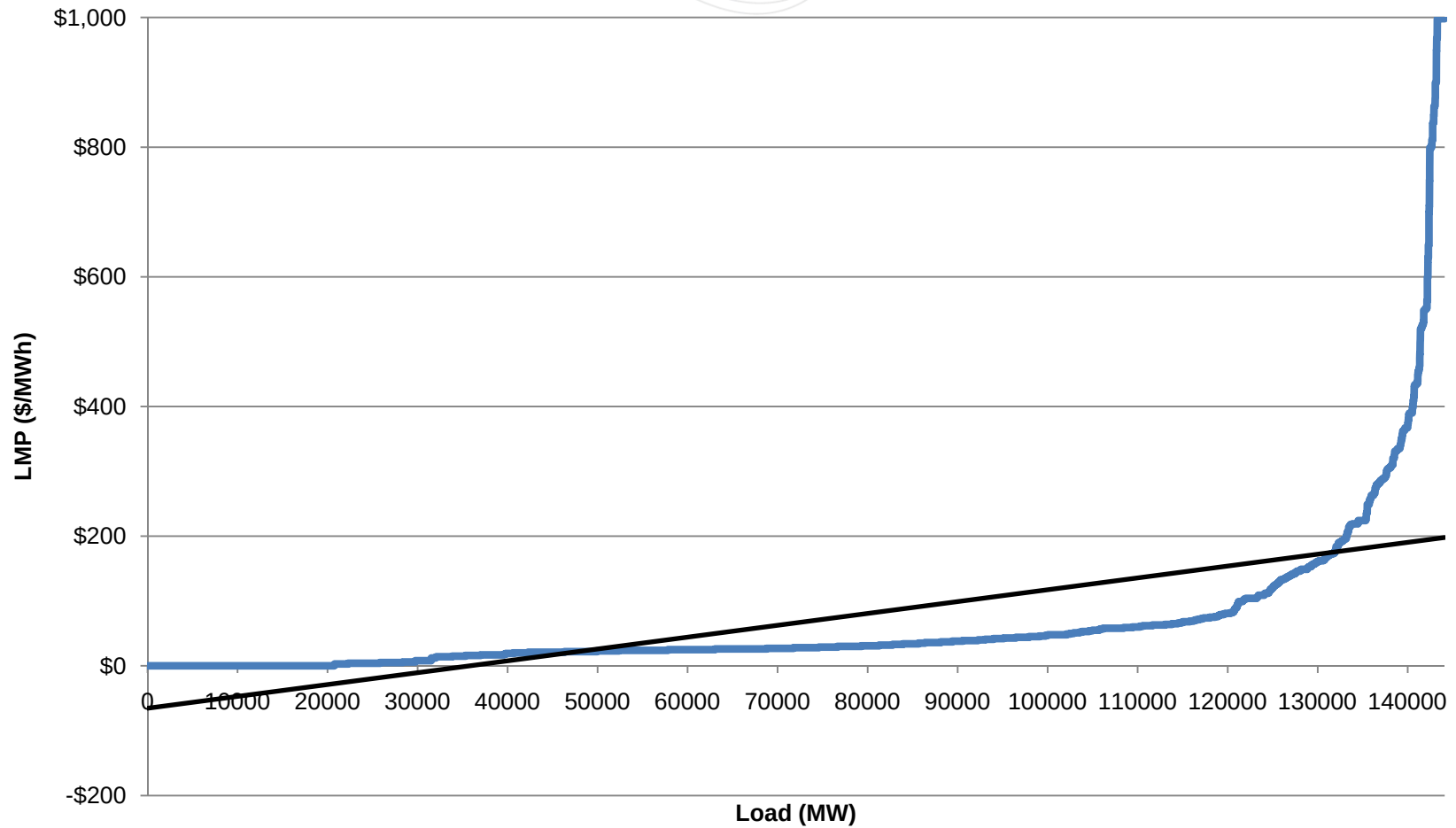
Supply Curve Tab

Year	Month	LMP	Total_gen_mw	Smoothed_curve_value
2011	7	970	154223.7419	869.22639
2011	7	971	154223.7419	869.22639
2011	7	972	154223.7419	869.22639
2011	7	973	154223.7419	869.22639
2011	7	974	154223.7419	869.22639
2011	7	975	154223.7419	869.22639
2011	7	976	154223.7419	869.22639
2011	7	977	154223.7419	869.22639
2011	7	978	154223.7419	869.22639
2011	7	979	154223.7419	869.22639
2011	7	980	154223.7419	869.22639
2011	7	981	154228.7419	869.90469
2011	7	982	154228.7419	869.90469
2011	7	983	154228.7419	869.90469
2011	7	984	154228.7419	869.90469
2011	7	985	154228.7419	869.90469
2011	7	986	154228.7419	869.90469
2011	7	987	154228.7419	869.90469
2011	7	988	154228.7419	869.90469
2011	7	989	154228.7419	869.90469
2011	7	990	154355.7419	887.31968
2011	7	991	154883.7419	963.70229
2011	7	992	154883.7419	963.70229
2011	7	993	154883.7419	963.70229
2011	7	994	154883.7419	963.70229
2011	7	995	154883.7419	963.70229
2011	7	996	154883.7419	963.70229
2011	7	997	154883.7419	963.70229
2011	7	998	154939.5806	972.17004
2011	7	999	154940.5161	972.31256

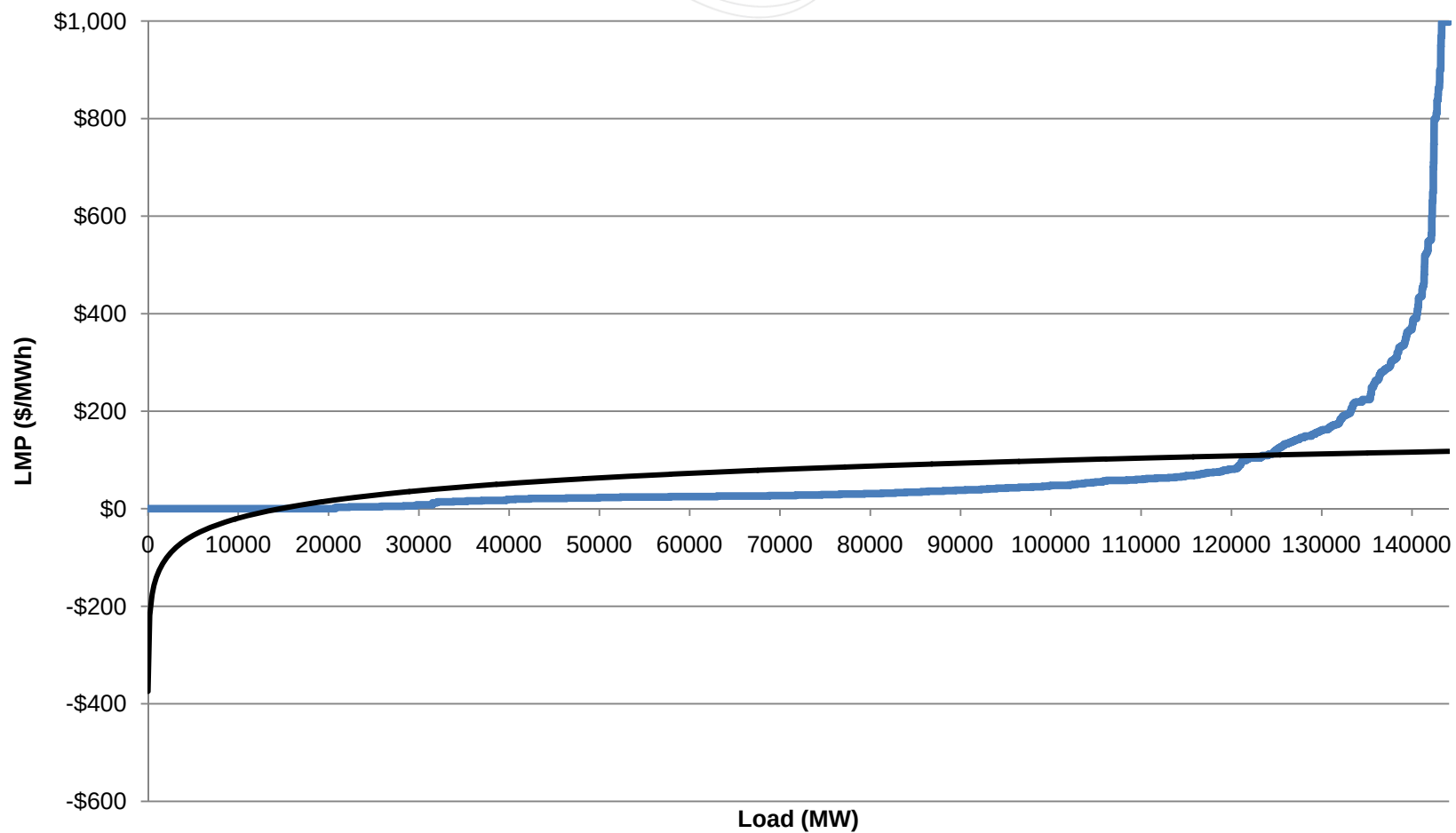
ATTACHMENT C

Results of Testing Various Equations To Find Best Fit Equation Form

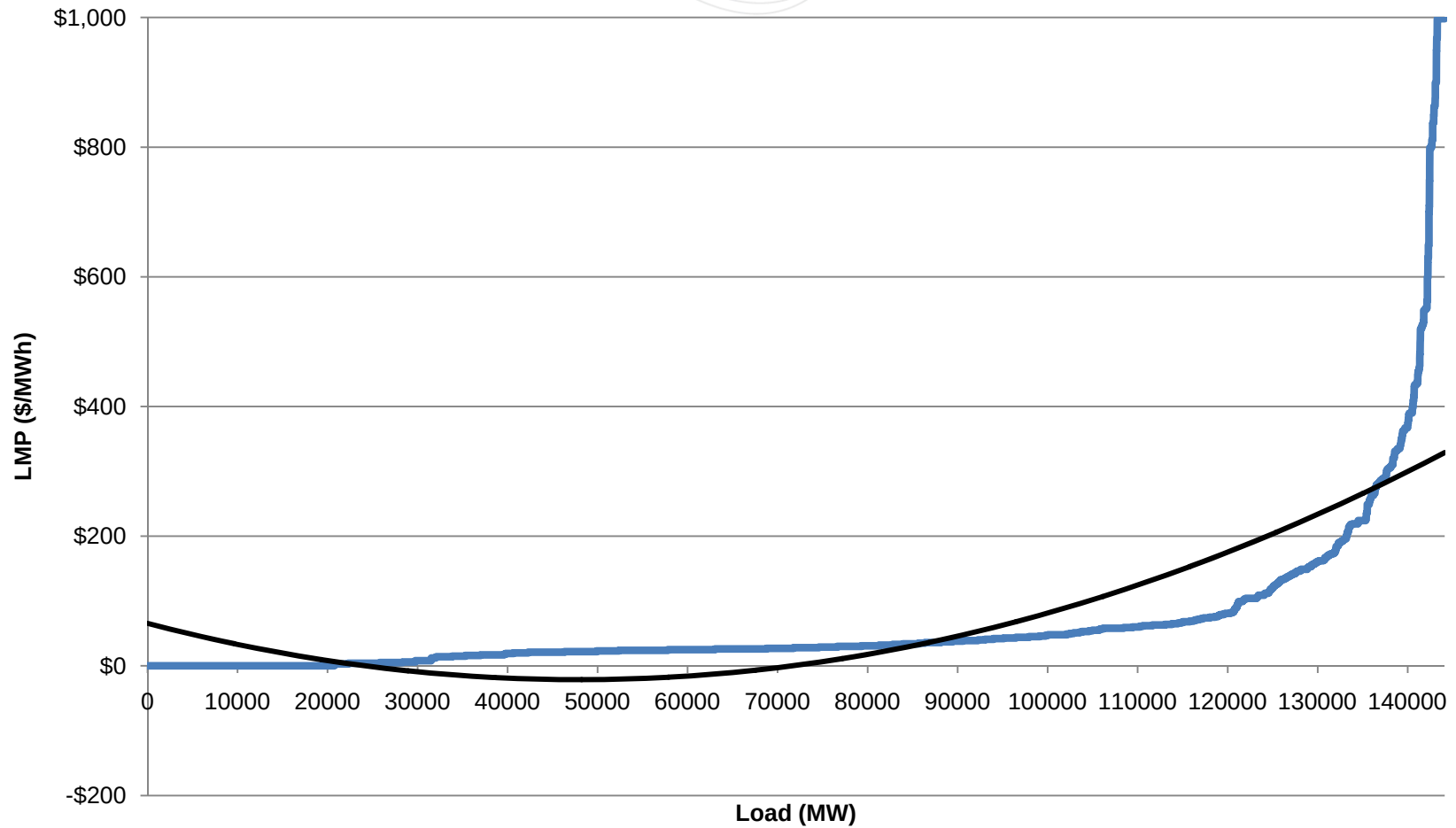
Sample Supply Curve (linear fit)



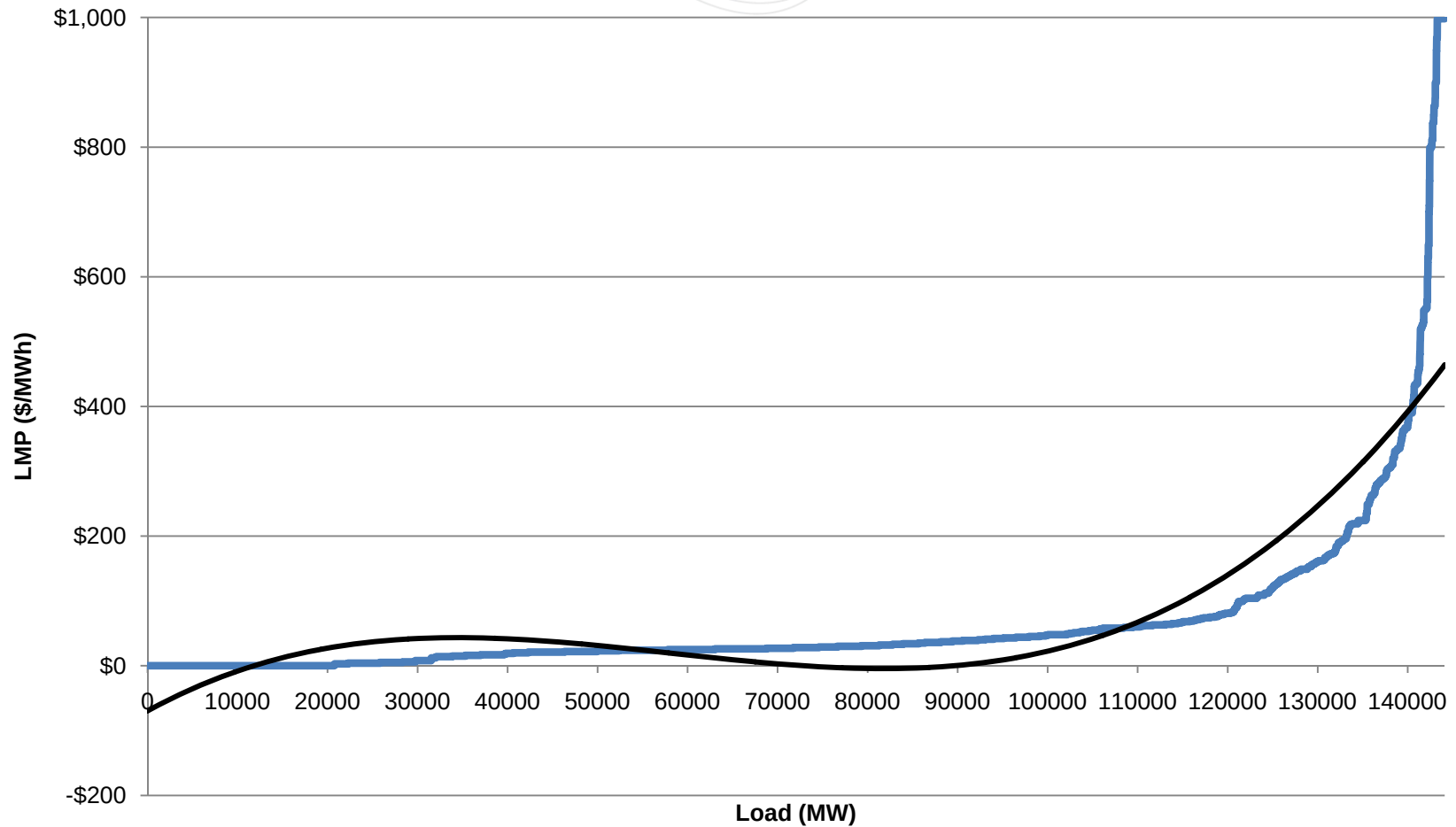
Sample Supply Curve (logarithmic fit)



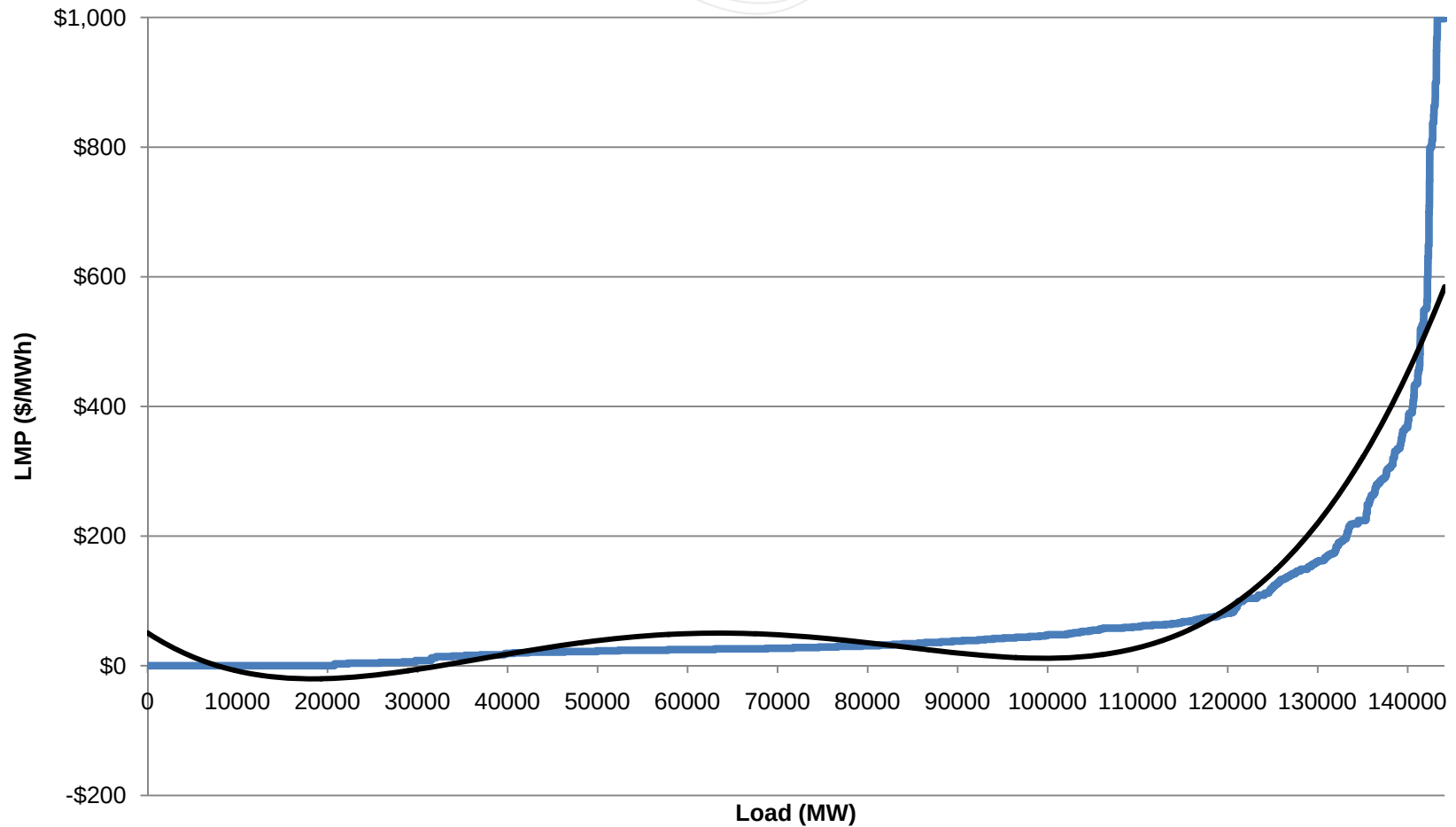
Sample Supply Curve (2nd order polynomial fit)



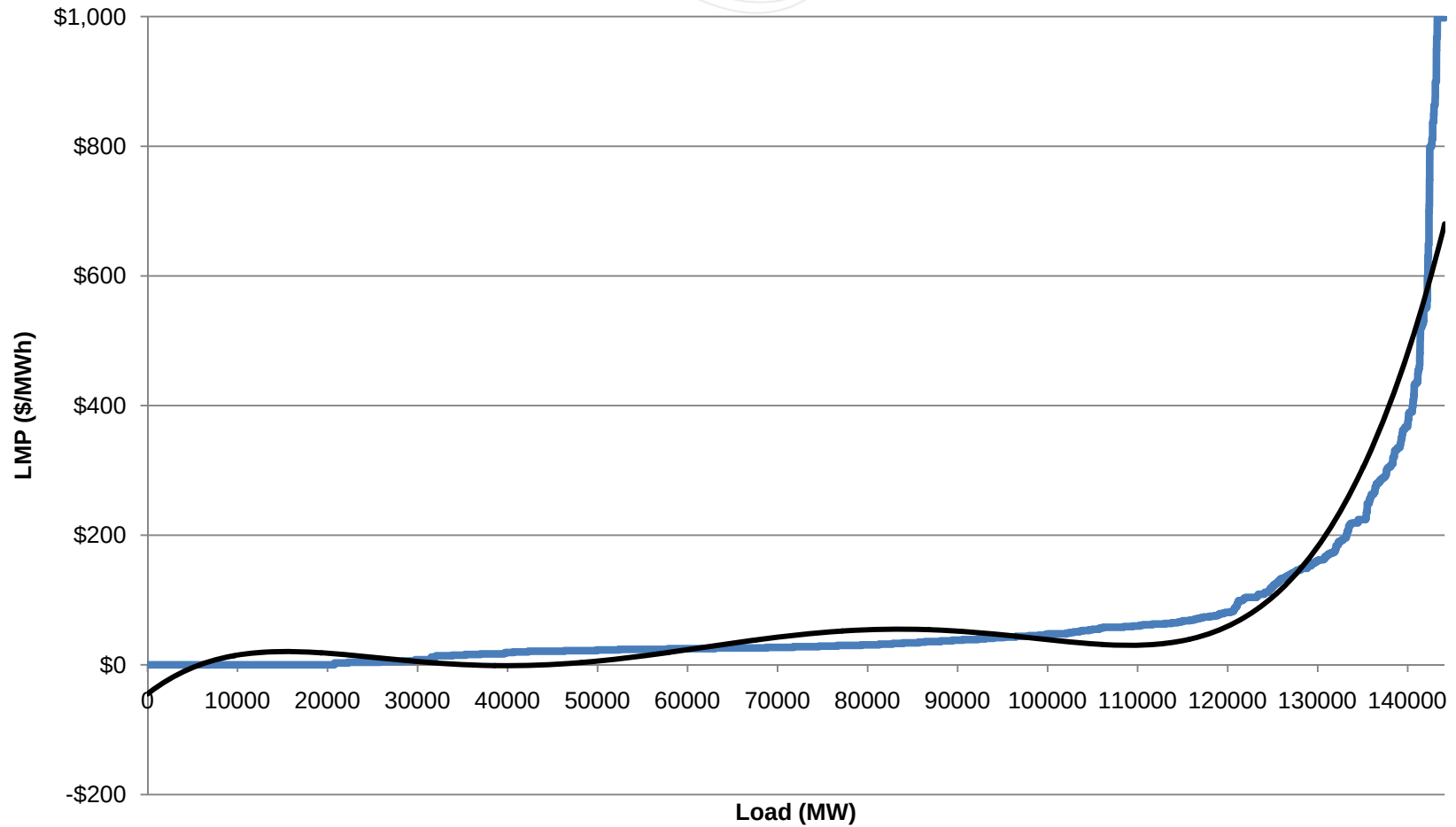
Sample Supply Curve (3rd order polynomial fit)



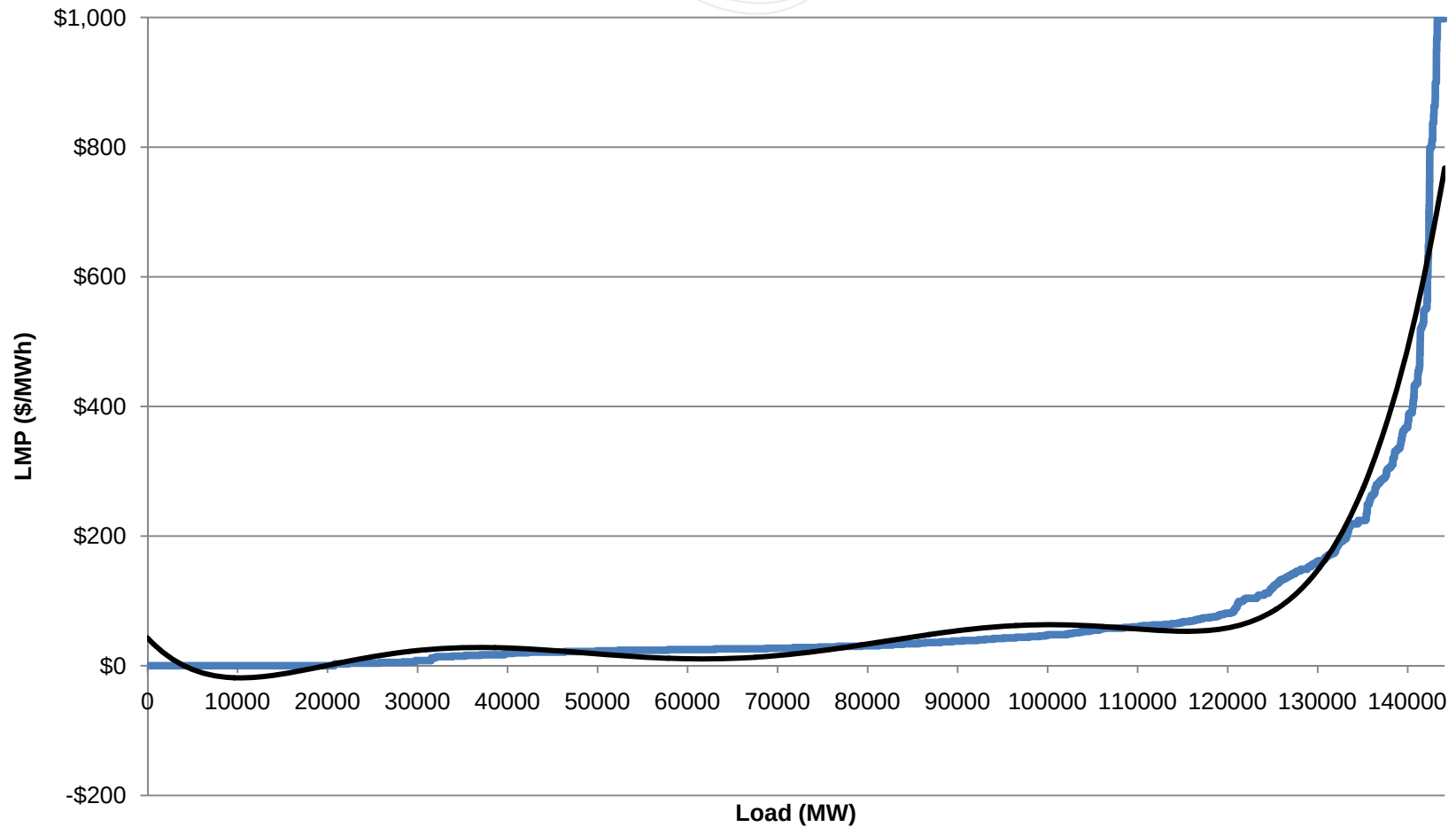
Sample Supply Curve (4th order polynomial fit)



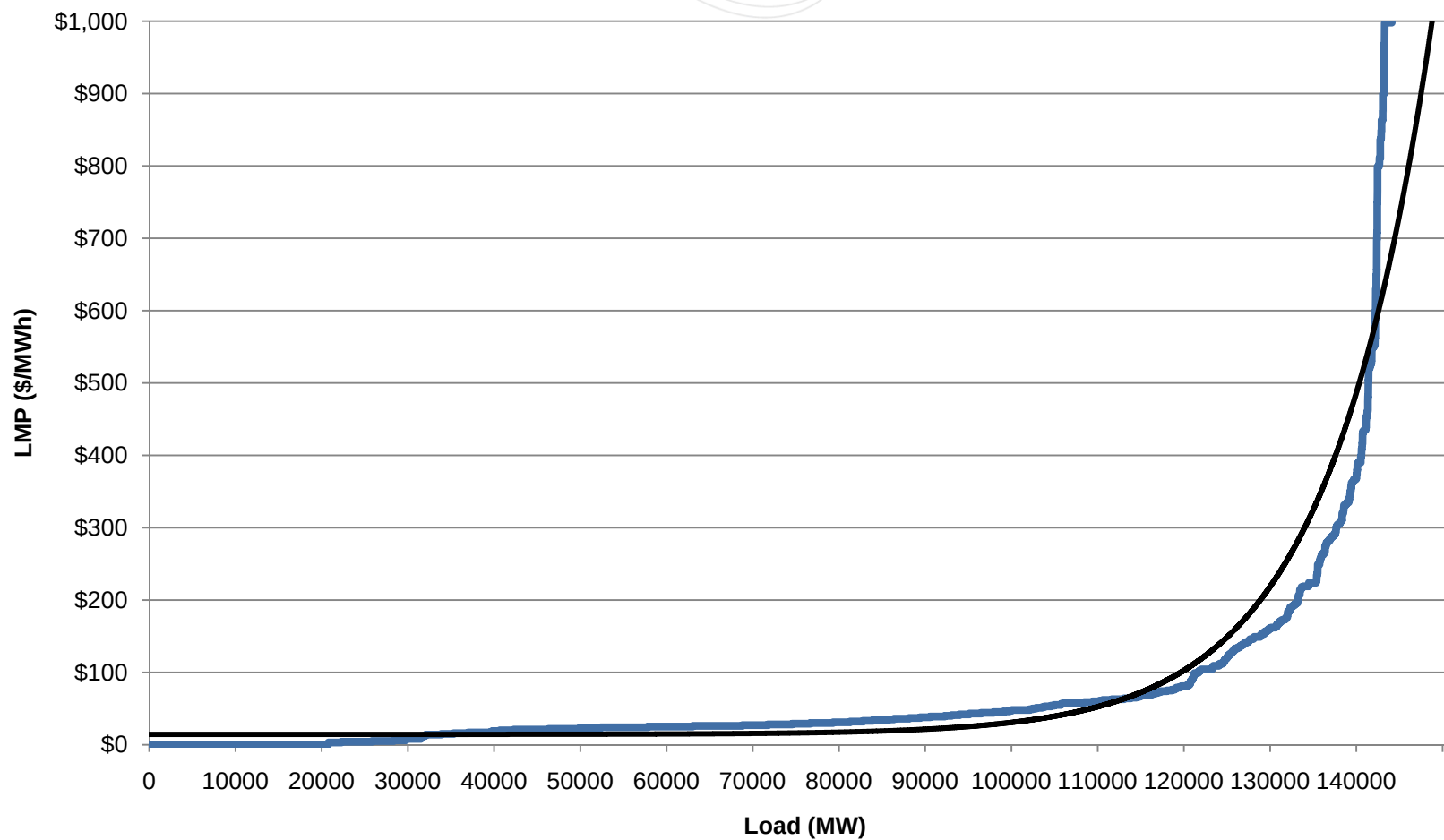
Sample Supply Curve (5th order polynomial fit)



Sample Supply Curve (6th order polynomial fit)



Sample Supply Curve (power function fit)



ATTACHMENT D

Revisions to Attachment K of the PJM Tariff (non-redlined)

1.3 Definitions.

1.3.1 Acceleration Request.

“Acceleration Request” shall mean a request pursuant to section 1.9.4A of this Schedule to accelerate or reschedule a transmission outage scheduled pursuant to sections 1.9.2 or 1.9.4.

1.3.1A Auction Revenue Rights.

“Auction Revenue Rights” or “ARRs” shall mean the right to receive the revenue from the Financial Transmission Right auction, as further described in Section 7.4 of this Schedule.

1.3.1B Auction Revenue Rights Credits.

“Auction Revenue Rights Credits” shall mean the allocated share of total FTR auction revenues or costs credited to each holder of Auction Revenue Rights, calculated and allocated as specified in Section 7.4.3 of this Schedule.

1.3.1B.01 Batch Load Demand Resource.

“Batch Load Demand Resource” shall mean a Demand Resource that has a cyclical production process such that at most times during the process it is consuming energy, but at consistent regular intervals, ordinarily for periods of less than ten minutes, it reduces its consumption of energy for its production processes to minimal or zero megawatts.

1.3.1B.02 Congestion Price.

“Congestion Price” shall mean the congestion component of the Locational Marginal Price, which is the effect on transmission congestion costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource, based on the effect of increased generation from or consumption by the resource on transmission line loadings, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.1B.03 Curtailment Service Provider.

“Curtailment Service Provider” or “CSP” shall mean a Member or a Special Member, which action on behalf of itself or one or more other Members or non-Members, participates in the PJM Interchange Energy Market by causing a reduction in demand.

1.3.1B.04 Day-ahead Congestion Price.

“Day-ahead Congestion Price” shall mean the Congestion Price resulting from the Day-ahead Energy Market.

1.3.1C Day-ahead Energy Market.

“Day-ahead Energy Market” shall mean the schedule of commitments for the purchase or sale of energy and payment of Transmission Congestion Charges developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1C.01 Day-ahead Loss Price.

“Day-ahead Loss Price” shall mean the Loss Price resulting from the Day-ahead Energy Market.

1.3.1D Day-ahead Prices.

“Day-ahead Prices” shall mean the Locational Marginal Prices resulting from the Day-ahead Energy Market.

1.3.1D.01 Day-ahead Scheduling Reserves.

“Day-ahead Scheduling Reserves” shall mean thirty-minute reserves as defined by the Reliability First Corporation and SERC.

1.3.1D.02 Day-ahead Scheduling Reserves Requirement.

“Day-ahead Scheduling Reserves Requirement” shall mean the thirty-minute reserve requirement for the PJM Region established consistent with Reliability First Corporation and SERC reliability standards, or those of any additional and/or successor regional reliability organization(s) that are responsible for establishing reliability requirements for the PJM Region, plus any additional thirty-minute reserves scheduled in response to an RTO-wide Hot or Cold Weather Alert or other reasons for conservative operations.

1.3.1D.03 Day-ahead Scheduling Reserves Resources.

“Day-ahead Scheduling Reserves Resources” shall mean synchronized and non-synchronized generation resources and Demand Resources electrically located within the PJM Region that are capable of providing Day-ahead Scheduling Reserves.

1.3.1D.04 Day-ahead Scheduling Reserves Market.

“Day-ahead Scheduling Reserves Market” shall mean the schedule of commitments for the purchase or sale of Day-ahead Scheduling Reserves developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1D.05 Day-ahead System Energy Price.

“Day-ahead System Energy Price” shall mean the System Energy Price resulting from the Day-ahead Energy Market.

1.3.1E Decrement Bid.

“Decrement Bid” shall mean a bid to purchase energy at a specified location in the Day-ahead Energy Market. An accepted Decrement Bid results in scheduled load at the specified location in the Day-ahead Energy Market.

1.3.1E.01 Demand Resource.

“Demand Resource” shall mean a resource with the capability to provide a reduction in demand.

1.3.1F Dispatch Rate.

“Dispatch Rate” shall mean the control signal, expressed in dollars per megawatt-hour, calculated and transmitted continuously and dynamically to direct the output level of all generation resources dispatched by the Office of the Interconnection in accordance with the Offer Data.

1.3.1G Energy Storage Resource.

“Energy Storage Resource” shall mean flywheel or battery storage facility solely used for short term storage and injection of energy at a later time to participate in the PJM energy and/or Ancilliary Services markets as a Market Seller.

1.3.2 Equivalent Load.

“Equivalent Load” shall mean the sum of a Market Participant’s net system requirements to serve its customer load in the PJM Region, if any, plus its net bilateral transactions.

1.3.2A Economic Load Response Participant.

“Economic Load Response Participant” shall mean a Member or Special Member that qualifies under Section 1.5A of this Schedule to participate in the PJM Interchange Energy Market through reductions in demand.

1.3.2A.01 Economic Minimum.

“Economic Minimum” shall mean the lowest incremental MW output level a unit can achieve while following economic dispatch.

1.3.2B Energy Market Opportunity Cost.

“Energy Market Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of available run hours due to limitations imposed on the unit by Applicable Laws and Regulations (as defined in PJM Tariff), and (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Energy Market Opportunity Cost therefore is

the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same compliance period, which compliance period is determined by the applicable regulatory authority and is reflected in the rules set forth in PJM Manual 15. Energy Market Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Energy Market Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.3 External Market Buyer.

"External Market Buyer" shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for consumption by end-users outside the PJM Region, or for load in the PJM Region that is not served by Network Transmission Service.

1.3.4 External Resource.

"External Resource" shall mean a generation resource located outside the metered boundaries of the PJM Region.

1.3.5 Financial Transmission Right.

"Financial Transmission Right" or "FTR" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2 of this Schedule.

1.3.5A Financial Transmission Right Obligation.

"Financial Transmission Right Obligation" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(b) of this Schedule.

1.3.5B Financial Transmission Right Option.

"Financial Transmission Right Option" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(c) of this Schedule.

1.3.6 Generating Market Buyer.

"Generating Market Buyer" shall mean an Internal Market Buyer that is a Load Serving Entity that owns or has contractual rights to the output of generation resources capable of serving the Market Buyer's load in the PJM Region, or of selling energy or related services in the PJM Interchange Energy Market or elsewhere.

1.3.7 Generator Forced Outage.

“Generator Forced Outage” shall mean an immediate reduction in output or capacity or removal from service, in whole or in part, of a generating unit by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the facility, as specified in the relevant portions of the PJM Manuals. A reduction in output or removal from service of a generating unit in response to changes in market conditions shall not constitute a Generator Forced Outage.

1.3.8 Generator Maintenance Outage.

“Generator Maintenance Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit in order to perform necessary repairs on specific components of the facility, if removal of the facility meets the guidelines specified in the PJM Manuals.

1.3.9 Generator Planned Outage.

“Generator Planned Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit for inspection, maintenance or repair with the approval of the Office of the Interconnection in accordance with the PJM Manuals.

1.3.9A Increment Bid.

“Increment Bid” shall mean an offer to sell energy at a specified location in the Day-ahead Energy Market. An accepted Increment Bid results in scheduled generation at the specified location in the Day-ahead Energy Market.

1.3.9B Interface Pricing Point.

“Interface Pricing Point” shall have the meaning specified in section 2.6A.

1.3.10 Internal Market Buyer.

“Internal Market Buyer” shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for ultimate consumption by end-users inside the PJM Region that are served by Network Transmission Service.

1.3.11 Inadvertent Interchange.

“Inadvertent Interchange” shall mean the difference between net actual energy flow and net scheduled energy flow into or out of the individual Control Areas operated by PJM.

1.3.11.01 Load Management.

“Load Management” shall mean either a Demand Resource (“DR”) or an Interruptible Load for Reliability (“ILR”) resource, both as defined in the Reliability Assurance Agreement.

1.3.11A Load Reduction Event.

“Load Reduction Event” shall mean a reduction in demand by a Member or Special Member for the purpose of participating in the PJM Interchange Energy Market.

1.3.11B Loss Price.

“Loss Price” shall mean the loss component of the Locational Marginal Price, which is the effect on transmission loss costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource based on the effect of increased generation from or consumption by the resource on transmission losses, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.12 Market Operations Center.

“Market Operations Center” shall mean the equipment, facilities and personnel used by or on behalf of a Market Participant to communicate and coordinate with the Office of the Interconnection in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.12A Maximum Emergency.

“Maximum Emergency” shall mean the designation of all or part of the output of a generating unit for which the designated output levels may require extraordinary procedures and therefore are available to the Office of the Interconnection only when the Office of the Interconnection declares a Maximum Generation Emergency and requests generation designated as Maximum Emergency to run. The Office of the Interconnection shall post on the PJM website the aggregate amount of megawatts that are classified as Maximum Emergency.

1.3.13 Maximum Generation Emergency.

“Maximum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection to address either a generation or transmission emergency in which the Office of the Interconnection anticipates requesting one or more Generation Capacity Resources, or Non-Retail Behind The Meter Generation resources to operate at its maximum net or gross electrical power output, subject to the equipment stress limits for such Generation Capacity Resource or Non-Retail Behind The Meter resource in order to manage, alleviate, or end the Emergency.

1.3.14 Minimum Generation Emergency.

“Minimum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection in which the Office of the Interconnection anticipates requesting one or more generating resources to operate at or below Normal Minimum Generation, in order to manage, alleviate, or end the Emergency.

1.3.14A NERC Interchange Distribution Calculator.

“NERC Interchange Distribution Calculator” shall mean the NERC mechanism that is in effect and being used to calculate the distribution of energy, over specific transmission interfaces, from energy transactions.

1.3.14B Net Benefits Test.

“Net Benefits Test” shall mean a calculation to determine whether the benefits of a reduction in price resulting from the dispatch of Economic Load Response exceeds the cost to other loads resulting from the billing unit effects of the load reduction, as specified in Section 3.3A.4 of this Schedule.

1.3.15 Network Resource.

“Network Resource” shall have the meaning specified in the PJM Tariff.

1.3.16 Network Service User.

“Network Service User” shall mean an entity using Network Transmission Service.

1.3.17 Network Transmission Service.

“Network Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part III of the PJM Tariff, or transmission service comparable to such service that is provided to a Load Serving Entity that is also a Transmission Owner.

1.3.17A Non-Regulatory Opportunity Cost.

“Non-Regulatory Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) a fuel supply limitation, for up to one year, resulting from an event of force majeure; and, (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Non-Regulatory Opportunity Cost therefore is the value associated with a specific generating unit’s lost opportunity to produce energy during a higher valued period of time occurring within the same period of time in which the unit is bound by the referenced restrictions, and is reflected in the rules set forth in PJM Manual 15. Non-Regulatory Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Non-Regulatory Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.17B Non-Variable Loads.

“Non-Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.18 Normal Maximum Generation.

“Normal Maximum Generation” shall mean the highest output level of a generating resource under normal operating conditions.

1.3.19 Normal Minimum Generation.

“Normal Minimum Generation” shall mean the lowest output level of a generating resource under normal operating conditions.

1.3.20 Offer Data.

“Offer Data” shall mean the scheduling, operations planning, dispatch, new resource, and other data and information necessary to schedule and dispatch generation resources and Demand Resource(s) for the provision of energy and other services and the maintenance of the reliability and security of the transmission system in the PJM Region, and specified for submission to the PJM Interchange Energy Market for such purposes by the Office of the Interconnection.

1.3.21 Office of the Interconnection Control Center.

“Office of the Interconnection Control Center” shall mean the equipment, facilities and personnel used by the Office of the Interconnection to coordinate and direct the operation of the PJM Region and to administer the PJM Interchange Energy Market, including facilities and equipment used to communicate and coordinate with the Market Participants in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.21A On-Site Generators.

“On-Site Generators” shall mean generation facilities (including Behind The Meter Generation) that (i) are not Capacity Resources, (ii) are not injecting into the grid, (iii) are either synchronized or non-synchronized to the Transmission System, and (iv) can be used to reduce demand for the purpose of participating in the PJM Interchange Energy Market.

1.3.22 Operating Day.

“Operating Day” shall mean the daily 24 hour period beginning at midnight for which transactions on the PJM Interchange Energy Market are scheduled.

1.3.23 Operating Margin.

“Operating Margin” shall mean the incremental adjustments, measured in megawatts, required in PJM Region operations in order to accommodate, on a first contingency basis, an operating contingency in the PJM Region resulting from operations in an interconnected Control Area. Such adjustments may result in constraints causing Transmission Congestion Charges, or may result in Ancillary Services charges pursuant to the PJM Tariff.

1.3.24 Operating Margin Customer.

“Operating Margin Customer” shall mean a Control Area purchasing Operating Margin pursuant to an agreement between such other Control Area and the LLC.

1.3.25 PJM Interchange.

“PJM Interchange” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds, or is exceeded by, the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller; or (e) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (f) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.26 PJM Interchange Export.

“PJM Interchange Export” shall mean the following, as determined in accordance with Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load is exceeded by the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup sales; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller.

1.3.27 PJM Interchange Import.

“PJM Interchange Import” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup purchases; or (c) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (d) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.28 PJM Open Access Same-time Information System.

“PJM Open Access Same-time Information System” shall mean the electronic communication system for the collection and dissemination of information about transmission services in the PJM Region, established and operated by the Office of the Interconnection in accordance with FERC standards and requirements.

1.3.28A Planning Period Quarter.

“Planning Period Quarter” shall mean any of the following three month periods in the Planning Period: June, July and August; September, October and November; December, January and February; or, March, April and May.

1.3.28B Planning Period Balance.

“Planning Period Balance” shall mean the entire period of time remaining in the Planning Period following the month that a monthly auction is conducted.

1.3.29 Point-to-Point Transmission Service.

“Point-to-Point Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part II of the PJM Tariff.

1.3.30 Ramping Capability.

“Ramping Capability” shall mean the sustained rate of change of generator output, in megawatts per minute.

1.3.30.01 Real-time Congestion Price.

“Real-time Congestion Price” shall mean the Congestion Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30.02 Real-time Loss Price.

“Real-time Loss Price” shall mean the Loss Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30A Real-time Prices.

“Real-time Prices” shall mean the Locational Marginal Prices resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30B Real-time Energy Market.

“Real-time Energy Market” shall mean the purchase or sale of energy and payment of Transmission Congestion Charges for quantity deviations from the Day-ahead Energy Market in the Operating Day.

1.3.30B.01 Real-time System Energy Price.

“Real-time System Energy Price” shall mean the System Energy Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.31 Regulation.

“Regulation” shall mean the capability of a specific generation resource or Demand Resource with appropriate telecommunications, control and response capability to increase or decrease its output or adjust load in response to a regulating control signal, in accordance with the specifications in the PJM Manuals.

1.3.31.01 Residual Auction Revenue Rights.

“Residual Auction Revenue Rights” shall mean incremental stage 1 Auction Revenue Rights created within a Planning Period by an increase in transmission system capability or a change in any other relevant factor that was not modeled pursuant to section 7.5 of Schedule 1 of this Agreement in compliance with section 7.4.2 (h) of Schedule 1 of this Agreement, and, if modeled, would have increased the amount of stage 1 Auction Revenue Rights allocated pursuant to section 7.4.2 of Schedule 1 of this Agreement; provided that, the foregoing notwithstanding, Residual Auction Revenue Rights shall exclude: 1) Incremental Auction Revenue Rights allocated pursuant to Part VI of the Tariff; and 2) Auction Revenue Rights allocated to entities that are assigned cost responsibility pursuant to Schedule 6 of this Agreement for transmission upgrades that create such rights.

1.3.31.02 Special Member.

“Special Member” shall mean an entity that satisfies the requirements of Section 1.5A.02 of this Schedule or the special membership provisions established under the Emergency Load Response Program.

1.3.31A [Reserved]

1.3.31B [Reserved]

1.3.32 Spot Market Backup.

“Spot Market Backup” shall mean the purchase of energy from, or the delivery of energy to, the PJM Interchange Energy Market in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason.

1.3.33 Spot Market Energy.

“Spot Market Energy” shall mean energy bought or sold by Market Participants through the PJM Interchange Energy Market at System Energy Prices determined as specified in Section 2 of this Schedule.

1.3.33A State Estimator.

“State Estimator” shall mean the computer model of power flows specified in Section 2.3 of this Schedule.

1.3.33B Station Power.

“Station Power” shall mean energy used for operating the electric equipment on the site of a generation facility located in the PJM Region or for the heating, lighting, air-conditioning and office equipment needs of buildings on the site of such a generation facility that are used in the operation, maintenance, or repair of the facility. Station Power does not include any energy (i) used to power synchronous condensers; (ii) used for pumping at a pumped storage facility; (iii) used for compressors at a compressed air energy storage facility; (iv) used for charging an Energy Storage Resource; or (v) used in association with restoration or black start service.

1.3.33B.01 Synchronized Reserve.

“Synchronized Reserve” shall mean the reserve capability of generation resources that can be converted fully into energy or Demand Resources whose demand can be reduced within ten minutes from the request of the Office of the Interconnection dispatcher, and is provided by equipment that is electrically synchronized to the Transmission System.

1.3.33B.02 Synchronized Reserve Event.

“Synchronized Reserve Event” shall mean a request from the Office of the Interconnection to generation resources and/or Demand Resources able, assigned or self-scheduled, to provide Synchronized Reserve within ten minutes, to increase the energy output or reduce load by the amount of assigned or self-scheduled Synchronized Reserve capability.

1.3.33B.03 System Energy Price.

“System Energy Price” shall mean the energy component of the Locational Marginal Price, which is the price at which the Market Seller has offered to supply an additional increment of energy from a resource, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.33C Target Allocation.

“Target Allocation” shall mean the allocation of Transmission Congestion Credits as set forth in Section 5.2.3 of this Schedule or the allocation of Auction Revenue Rights Credits as set forth in Section 7.4.3 of this Schedule.

1.3.34 Transmission Congestion Charge.

“Transmission Congestion Charge” shall mean a charge attributable to the increased cost of energy delivered at a given load bus when the transmission system serving that load bus is operating under constrained conditions, or as necessary to provide energy for third-party transmission losses in accordance with Section 9.3, which shall be calculated and allocated as specified in Section 5.1 of this Schedule.

1.3.35 Transmission Congestion Credit.

“Transmission Congestion Credit” shall mean the allocated share of total Transmission Congestion Charges credited to each holder of Financial Transmission Rights, calculated and allocated as specified in Section 5.2 of this Schedule.

1.3.36 Transmission Customer.

“Transmission Customer” shall mean an entity using Point-to-Point Transmission Service.

1.3.37 Transmission Forced Outage.

“Transmission Forced Outage” shall mean an immediate removal from service of a transmission facility by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the transmission facility, as specified in the relevant portions of the PJM Manuals. A removal from service of a transmission facility at the request of the Office of the Interconnection to improve transmission capability shall not constitute a Forced Transmission Outage.

1.3.37A Transmission Loading Relief.

“Transmission Loading Relief” shall mean NERC’s procedures for preventing operating security limit violations, as implemented by PJM as the security coordinator responsible for maintaining transmission security for the PJM Region.

1.3.37B Transmission Loading Relief Customer.

“Transmission Loading Relief Customer” shall mean an entity that, in accordance with Section 1.10.6A, has elected to pay Transmission Congestion Charges during Transmission Loading Relief in order to continue energy schedules over contract paths outside the PJM Region that are increasing the cost of energy in the PJM Region.

1.3.37C Transmission Loss Charge.

“Transmission Loss Charge” shall mean the charges to each Market Participant, Network Customer, or Transmission Customer for the cost of energy lost in the transmission of electricity from a generation resource to load as specified in Section 5 of this Schedule.

1.3.38 Transmission Planned Outage.

“Transmission Planned Outage” shall mean any transmission outage scheduled in advance for a pre-determined duration and which meets the notification requirements for such outages specified in this Agreement or the PJM Manuals.

1.3.38A Variable Loads.

“Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.39 Zonal Base Load.

“Zonal Base Load” shall mean the lowest daily zonal peak load from the twelve month period ending October 21 of the calendar year immediately preceding the calendar year in which an annual Auction Revenue Right allocation is conducted, increased by the projected load growth rate for the relevant Zone.

1.5A Economic Load Response Participant.

As used in this section 1.5A, the term “end-use customer” refers to an individual location or aggregation of locations that consume electricity as identified by a unique electric distribution company account number.

1.5A.1 Qualification.

A Member or Special Member that is an end-use customer, Load Serving Entity or Curtailment Service Provider that has the ability to cause a reduction in demand as metered on an electric distribution company account basis or has an On-Site Generator that enables demand reduction may become an Economic Load Response Participant by complying with the requirements of the applicable Relevant Electric Retail Regulatory Authority and all other applicable federal, state and local regulatory entities together with this section 1.5A including, but not limited to, section 1.5A.3. A Member or Special Member may aggregate multiple individual end-use customer sites to qualify as an Economic Load Response Participant, subject to the requirements of Section 1.5A.10.

1.5A.2 Special Member.

Entities that are not Members and desire to participate solely in the Real-time Energy Market by reducing demand may become a Special Member by paying an annual membership fee of \$500 plus 10% of each payment owed by PJM Settlement for a Load Reduction Event not to exceed \$5,000 in a calendar year. For entities that become Special Members pursuant to this section, the following obligations are waived: (1) the \$1,500 membership application fee set forth in section 1.4.3 of this Agreement; (ii) liability under section 15.2 of this Agreement for Member defaults; (iii) thirty days notice for waiting period; and (iv) the requirement for 24/7 control center coverage. In addition, such Members shall not have voting privileges in committees or sector designations, and shall not be permitted to form user groups. On January 1 of a calendar year, a Special Member under this section, at its sole election, may become a Member rather than a Special Member subject to all rules governing being a Member, including regular application and membership fee requirements.

1.5A.3 Registration.

1. Prior to participating in the PJM Interchange Energy Market or Ancillary Services Market, Economic Load Response Participants must complete the Economic Load Response Registration Form posted on the Office of the Interconnection’s website and submit such form to the Office of the Interconnection for each end-use customer, or aggregation of end-use customers, pursuant to the requirements set forth in the PJM Manuals.

a. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the

appropriate electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is subject to another contractual obligation or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program. The electric distribution company or Load Serving Entity shall have ten business days to respond. An electric distribution company or Load Serving Entity which seeks to assert that the laws or regulations of the Relevant Electric Retail Regulatory Authority prohibit or condition (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response program shall provide to PJM, within the referenced ten business day review period, either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

- ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall assume that the load to be reduced is not subject to other contractual obligations or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program, and the Office of the Interconnection shall accept the registration, provided it meets the requirements of this section 1.5A.
- b. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:
- i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the appropriate electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is permitted to participate in PJM's Economic Load Response Program. The electric distribution company or Load Serving Entity shall have ten business days to respond. If the electric distribution company or Load Serving Entity verifies that the load that may be reduced is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then the electric distribution company or the Load Serving Entity must provide to the Office of the Interconnection within the referenced ten business day review period evidence from the Relevant Electric

Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

- ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall reject the registration. If it is able to do so in compliance with section 1.5A hereof, including section 1.5A.3, the Economic Load Response Participant may submit a new registration for consideration if a prior registration has been rejected pursuant to this subsection.

2. In the event that the end-use customer is subject to another contractual obligation, special settlement terms may be employed to accommodate such contractual obligation. The Office of the Interconnection shall notify the end-use customer or appropriate Curtailment Service Provider, electric distribution company or Load Serving Entity that the Economic Load Response Participant has or has not met the requirements of this section 1.5A. End-use customers that desire not to be simultaneously registered to reduce demand under the Emergency Load Response Program and under this section, upon one-day advance notice to the Office of the Interconnection, may switch its registration for reducing demand, if it has been registered to reduce load for 15 consecutive days under its current registration.

1.5A.3.01 Economic Load Response Registrations in Effect as of August 28, 2009

1. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

- a. Effective as of the later of either August 28, 2009 (the effective date of Wholesale Competition in Regions with Organized Electric Markets, Order 719-A, 128 FERC ¶ 61,059 (2009) ("Order 719-A")) or the effective date of a Relevant Electric Retail Regulatory Authority law or regulation prohibiting or conditioning (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response Program, the existing Economic Load Response Participant's registration submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated upon an electric distribution company or Load Serving Entity submitting to the Office of the Interconnection either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's

participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.

2. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:

a. Effective as of August 28, 2009 (the effective date of Order 719-A), an existing Economic Load Response Participant's registration submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated unless an electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program and provides evidence to the Office of the Interconnection documenting that the permission or conditional permission is pursuant to the laws or regulations of the Relevant Electric Retail Regulatory Authority. If the electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then, within ten business days of verifying such permission or conditional permission, the electric distribution company or Load Serving Entity must provide to the Office of the Interconnection evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.

3. All registrations submitted to the Office of the Interconnection on or after August 28, 2009, including requests to extend existing registrations, will be processed by the Office of the Interconnection in accordance with the provisions of section 1.5A, including section 1.5A.3.

1.5A.4 Metering and Electronic Dispatch Signal.

a) The Curtailment Service Provider is responsible to ensure that the Economic Load Response Participants have metering equipment that provides integrated hourly kWh values on an electric distribution company account basis. The metering equipment shall either meet the electric distribution company requirements for accuracy, or have a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment and associated data shall meet the requirements set forth herein and in the PJM Manuals. The Economic Load Response Participant must meter reductions in demand either by recording integrated hourly values for On-Site Generators running to serve local load (net of output used by the On-Site Generator), by metering load on an electric distribution company account basis and comparing actual metered load to its Customer Baseline Load, calculated pursuant to section 3.3A of this Schedule, or on an alternative metering basis approved by the Office of the Interconnection and agreed upon by all relevant parties, including any Curtailment Service Provider, Load Serving Entity and end-use customer. To qualify for compensation for such load reductions that are not metered directly by the Office of the Interconnection, hourly data reflecting meter readings for each day during which the load reduction occurred and all associated days to determine the reduction must be submitted to the Office of the Interconnection in accordance with the PJM Manuals within 60 days of the load reduction.

b) Curtailment Service Providers shall be responsible for maintaining, or ensuring that Economic Load Response Participants maintain, the capability to receive and act upon an electronic dispatch signal from the Office of the Interconnection in accordance with any standards and specifications contained in the PJM Manuals.

1.5A.5 On-Site Generators.

An Economic Load Response Participant that intends to use an On-Site Generator for the purpose of reducing demand to participate in the PJM Interchange Energy Market shall represent to the Office of the Interconnection in writing that it holds all necessary environmental permits applicable to the operation of the On-Site Generator. Unless notified otherwise, the Office of the Interconnection shall deem such representation applies to each time the On-Site Generator is used to reduce demand to enable participation in the PJM Interchange Energy Market and that the On-Site Generator is being operated in compliance with all applicable permits, including any emissions, run-time limits or other operational constraints that may be imposed by such permits.

1.5A.6 Variable-Load Customers.

The loads of an Economic Load Response Participant shall be categorized as Variable or Non-variable at the time the load is registered, based on hourly load data for the most recent 60 days

provided by the participant in the registration process; provided, however, that any alternative means of making such determination when 60 days of data is not available shall be subject to review and approval by the Office of the Interconnection. Non-Variable Loads shall be those for which the Customer Baseline Load calculation and adjustment methods prescribed by sections 3.3A.2 and 3.3A.3 result in a relative root mean square hourly error of twenty percent or less compared to the actual hourly loads based on the hourly load data provided in the registration process and using statistical methods prescribed in the PJM Manuals. All other loads shall be Variable Loads.

1.5A.7 Non-Hourly Metered Customer Pilot.

Non-hourly metered customers may participate in the PJM Interchange Energy Market as Economic Load Response Participants on a pilot basis under the following circumstances. The customer or its Curtailment Service Provider or Load Serving Entity must propose an alternate method for measuring hourly demand reductions. The Office of the Interconnection shall approve alternate measurement mechanisms on a case-by-case basis for a time specified by the Office of the Interconnection ("Pilot Period"). In the event an alternative measurement mechanism is approved, the Office of the Interconnection shall notify the affected Load Serving Entity(ies) that a proposed alternate measurement mechanism has been approved for a Pilot Period. Demand reductions by non-hourly metered customers using alternate measurement mechanisms on a pilot basis shall be limited to a combined total of 500 MW of reductions in both the Emergency Load Response Program and the PJM Interchange Energy Market. With the sole exception of the requirement for hourly metering as set forth in Section 1.5A.4 of this Schedule, non-hourly metered customers that qualify as Economic Load Response Participants pursuant to this section 1.5A.7 shall be subject to the rules and procedures for participation by Economic Load Response Participants in the PJM Interchange Energy Market, including, without limitation, the Net Benefits Test and the requirement for dispatch by the Office of the Interconnection. Following completion of a Pilot Period, the alternate method shall be evaluated by the Office of the Interconnection to determine whether such alternate method should be included in the PJM Manuals as an accepted measurement mechanism for demand reductions in the PJM Interchange Energy Market.

1.5A.8 Batch Load Demand Resource Provision of Synchronized Reserve or Day-Ahead Scheduling Reserves.

(a) A Batch Load Demand Resource may provide Synchronized Reserve or Day-Ahead Scheduling Reserves in the PJM Interchange Energy Market provided it has pre-qualified by providing the Office of the Interconnection with documentation acceptable to the Office of the Interconnection that shows six months of one minute incremental load history of the Batch Load Demand Resource, or in the event such history is unavailable, other such information or data acceptable to the Office of the Interconnection to demonstrate that the resource meets the definition of "Batch Load Demand Resource" pursuant to section 1.3.1A.001 of this Schedule. This requirement is a one-time pre-qualification requirement for a Batch Load Demand Resource.

(b) Batch Load Demand Resources may provide up to 20 percent of the total system-wide PJM Synchronized Reserve requirement in any hour, or up to 20 percent of the total system-wide Day-Ahead Scheduling Reserves requirement in any hour; provided, however, that in the event the Office of the Interconnection determines in its sole discretion that satisfying 20 percent of either such requirement from Batch Load Demand Resources is causing or may cause a reliability degradation, the Office of the Interconnection may reduce the percentage of either such requirement that may be satisfied by Batch Load Demand Resources in any hour to as low as 10 percent. This reduction will be effective seven days after the posting of the reduction on the PJM website. Notwithstanding anything to the contrary in this Agreement, as soon as practicable, the Office of the Interconnection unilaterally shall make a filing under section 205 of the Federal Power Act to revise the rules for Batch Load Demand Resources so as to continue such reduction. The reduction shall remain in effect until the Commission acts upon the Office of the Interconnection's filing and thereafter if approved or accepted by the Commission.

(c) A Batch Load Demand Resource that is consuming energy at the start of a Synchronized Reserve Event, or, if committed to provide Day-Ahead Scheduling Reserves, at the time of a dispatch instruction from the Office of the Interconnection to reduce load, shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event, or to such instruction to reduce load, by reducing load as quickly as it is capable and by keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following the reduction, or, in the case of Day-Ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required. A Batch Load Demand Resource that has reduced its consumption of energy for its production processes to minimal or zero megawatts before the start of a Synchronized Reserve Event (or, in the case of Day-Ahead Scheduling Reserves, before a dispatch instruction to reduce load) shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event (or such instruction to reduce load) by reducing any load that is present at the time the Synchronized Reserve Event is called (or at the time of such instruction to reduce load) as quickly as it is capable, delaying the restart of its production processes, and keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following any such reduction (or, in the case of Day-Ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required). Failure to respond as described in this section shall be considered non-compliance with the Office of the Interconnection's dispatch instruction associated with a Synchronized Reserve Event, or as applicable, associated with an instruction to a resource committed to provide Day-Ahead Scheduling Reserves to reduce load.

1.5A.9 Day-ahead and Real-time Energy Market Participation.

Economic Load Response Participants shall be compensated under section 3.3A.5 and 3.3A.6 only if they participate in the Day-ahead or Real-time Energy Markets as a dispatchable resource.

1.5A.10 Economic Load Response Participant Aggregation.

The purpose for aggregation is to allow the participation of End-Use Customers in the Energy Market that can provide less than 100 kW of demand response when they currently have no

alternative opportunity to participate on an individual basis or can provide less than 500 kW of demand response in the Day-Ahead Scheduling Reserve, Synchronized Reserve or Regulation markets when they currently have no alternative opportunity to participate on an individual basis. Aggregations pursuant to Section 1.5A.1 shall be subject to the following requirements:

- i. All End-Use Customers in an aggregation shall be specifically identified;
- ii. All End-Use Customers in an aggregation shall be served by the same electric distribution company or Load Serving Entity where the electric distribution company is the Load Serving Entity for all End-Use Customers in the aggregation. If the aggregation will provide Synchronized Reserves, all customers in the aggregation must also be part of the same Synchronized Reserve sub-zone;
- iii. All End-Use Customers in an aggregation that settle at Transmission Zone, existing load aggregate, or node prices shall be located in the same Transmission Zone, existing load aggregate or at the same node, respectively;
- iv. A single CBL for the aggregation shall be used to determine settlements pursuant to Sections 3.3A.5 and 3.3A.6;
- v. If the aggregation will only provide energy to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 99 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve. If the aggregation will provide an Ancillary Service to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 499 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve;
- vi. Each End-Use Customer site must meet the requirements for market participation by a Demand Resource except for the 100 kW minimum load reduction requirement for energy or the 500 kW minimum load reduction requirement for Ancillary Services; and
- vii. An End-Use Customer's participation in the Energy and Ancillary Services markets shall be administered under one economic registration.

1.5A.11 Reporting

- (a) PJM will post on its website a report of demand response activity, and will provide a summary thereof to the PJM Markets and Reliability Committee on an annual basis.
- (b) As PJM receives evidence from the electric distribution companies or Load Serving Entities pursuant to section 1.5A.3, PJM will post on its website a list of those Relevant Electric Retail Regulatory Authorities that the electric distribution companies or Load Serving Entities assert prohibit or condition retail participation in PJM's Economic Load Response Program together with a corresponding reference to the Relevant Electric Retail Regulatory

Authority evidence that is provided to PJM by the electric distribution companies or Load Serving Entities.

1.7 General.

1.7.1 Market Sellers.

Only Market Sellers shall be eligible to submit offers to the Office of the Interconnection for the sale of electric energy or related services in the PJM Interchange Energy Market. Market Sellers shall comply with the prices, terms, and operating characteristics of all Offer Data submitted to and accepted by the PJM Interchange Energy Market.

1.7.2 Market Buyers.

Only Market Buyers shall be eligible to purchase energy or related services in the PJM Interchange Energy Market. Market Buyers shall comply with all requirements for making purchases from the PJM Interchange Energy Market.

1.7.2A Economic Load Response Participants.

Only Economic Load Response Participants shall be eligible to participate in the Real-time Energy Market and the Day-ahead Energy Market by submitting offers to the Office of the Interconnection to reduce demand.

1.7.3 Agents.

A Market Participant may participate in the PJM Interchange Energy Market through an agent, provided that the Market Participant informs the Office of the Interconnection in advance in writing of the appointment of such agent. A Market Participant participating in the PJM Interchange Energy Market through an agent shall be bound by all of the acts or representations of such agent with respect to transactions in the PJM Interchange Energy Market, and shall ensure that any such agent complies with the requirements of this Agreement.

1.7.4 General Obligations of the Market Participants.

(a) In performing its obligations to the Office of the Interconnection hereunder, each Market Participant shall at all times (i) follow Good Utility Practice, (ii) comply with all applicable laws and regulations, (iii) comply with the applicable principles, guidelines, standards and requirements of FERC, NERC and Applicable Regional Reliability Councils, (iv) comply with the procedures established for operation of the PJM Interchange Energy Market and PJM Region and (v) cooperate with the Office of the Interconnection as necessary for the operation of the PJM Region in a safe, reliable manner consistent with Good Utility Practice.

(b) Market Participants shall undertake all operations in or affecting the PJM Interchange Energy Market and the PJM Region including but not limited to compliance with all Emergency procedures, in accordance with the power and authority of the Office of the Interconnection with respect to the operation of the PJM Interchange Energy Market and the PJM Region as established in this Agreement, and as specified in the Schedules to this Agreement and the PJM Manuals. Failure to comply with the foregoing operational

requirements shall subject a Market Participant to such reasonable charges or other remedies or sanctions for non-compliance as may be established by the PJM Board, including legal or regulatory proceedings as authorized by the PJM Board to enforce the obligations of this Agreement.

(c) The Office of the Interconnection may establish such committees with a representative of each Market Participant, and the Market Participants agree to provide appropriately qualified personnel for such committees, as may be necessary for the Office of the Interconnection and PJMSettlement to perform its obligations hereunder.

(d) All Market Participants shall provide to the Office of the Interconnection the scheduling and other information specified in the Schedules to this Agreement, and such other information as the Office of the Interconnection may reasonably require for the reliable and efficient operation of the PJM Region and PJM Interchange Energy Market, and for compliance with applicable regulatory requirements for posting market and related information. Such information shall be provided as much in advance as possible, but in no event later than the deadlines established by the Schedules to this Agreement, or by the Office of the Interconnection in conformance with such Schedules. Such information shall include, but not be limited to, maintenance and other anticipated outages of generation or transmission facilities, scheduling and related information on bilateral transactions and self-scheduled resources, and implementation of active load management, interruption of load, and other load reduction measures. The Office of the Interconnection shall abide by appropriate requirements for the non-disclosure and protection of any confidential or proprietary information given to the Office of the Interconnection by a Market Participant. Each Market Participant shall maintain or cause to be maintained compatible information and communications systems, as specified by the Office of the Interconnection, required to transmit scheduling, dispatch, or other time-sensitive information to the Office of the Interconnection in a timely manner.

(e) Subject to the requirements for Economic Load Response Participants in section 1.5A above, each Market Participant shall install and operate, or shall otherwise arrange for, metering and related equipment capable of recording and transmitting all voice and data communications reasonably necessary for the Office of the Interconnection and PJMSettlement to perform the services specified in this Agreement. A Market Participant that elects to be separately billed for its PJM Interchange shall, to the extent necessary, be individually metered in accordance with Section 14 of this Agreement, or shall agree upon an allocation of PJM Interchange between it and the Market Participant through whose meters the unmetered Market Participant's PJM Interchange is delivered. The Office of the Interconnection shall be notified of the allocation by the foregoing Market Participants.

(f) Each Market Participant shall operate, or shall cause to be operated, any generating resources owned or controlled by such Market Participant that are within the PJM Region or otherwise supplying energy to or through the PJM Region in a manner that is consistent with the standards, requirements or directions of the Office of the Interconnection and that will permit the Office of the Interconnection to perform its obligations under this Agreement; provided, however, no Market Participant shall be required to take any action that is inconsistent with Good Utility Practice or applicable law.

(g) Each Market Participant shall follow the directions of the Office of the Interconnection to take actions to prevent, manage, alleviate or end an Emergency in a manner consistent with this Agreement and the procedures of the PJM Region as specified in the PJM Manuals.

(h) Each Market Participant shall obtain and maintain all permits, licenses or approvals required for the Market Participant to participate in the PJM Interchange Energy Market in the manner contemplated by this Agreement.

(i) Consistent with Section 36.1.1 of the PJM Tariff, to the extent its generating facility is dispatchable, a Market Participant shall submit an Economic Minimum in the Real-time Energy Market that is no greater than the higher of its physical operating minimum or its Capacity Interconnection Rights, as that term is defined in the PJM Tariff, associated with such generating facility under its Interconnection Service Agreement under Attachment O of the PJM Tariff or a wholesale market participation agreement.

1.7.5 Market Operations Center.

Each Market Participant shall maintain a Market Operations Center, or shall make appropriate arrangements for the performance of such services on its behalf. A Market Operations Center shall meet the performance, equipment, communications, staffing and training standards and requirements specified in this Agreement for the scheduling and completion of transactions in the PJM Interchange Energy Market and the maintenance of the reliable operation of the PJM Region, and shall be sufficient to enable (i) a Market Seller or an Economic Load Response Participant to perform all terms and conditions of its offers to the PJM Interchange Energy Market, and (ii) a Market Buyer or an Economic Load Response Participant to conform to the requirements for purchasing from the PJM Interchange Energy Market.

1.7.6 Scheduling and Dispatching.

(a) The Office of the Interconnection shall schedule and dispatch in real-time generation resources and/or Demand Resources economically on the basis of least-cost, security-constrained dispatch and the prices and operating characteristics offered by Market Sellers, continuing until sufficient generation resources and/or Demand Resources are dispatched to serve the PJM Interchange Energy Market energy purchase requirements under normal system conditions of the Market Buyers, as well as the requirements of the PJM Region for ancillary services provided by generation resources and/or Demand Resources, in accordance with this Agreement. Such scheduling and dispatch shall recognize transmission constraints on coordinated flowgates external to the Transmission System in accordance with Appendix A to the Joint Operating Agreement between the Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C. (PJM Rate Schedule FERC No. 38) and on other such flowgates that are coordinated in accordance with agreements between the LLC and other entities. Scheduling and dispatch shall be conducted in accordance with this Agreement.

(b) The Office of the Interconnection shall undertake to identify any conflict or incompatibility between the scheduling or other deadlines or specifications applicable to the PJM Interchange Energy Market, and any relevant procedures of another Control Area, or any tariff (including the PJM Tariff). Upon determining that any such conflict or incompatibility exists, the Office of the Interconnection shall propose tariff or procedural changes, and undertake such other efforts as may be appropriate, to resolve any such conflict or incompatibility.

(c) To protect its generation or distribution facilities, or local Transmission Facilities not under the monitoring responsibility and dispatch control of the Office of the Interconnection, an entity may request that the Office of the Interconnection schedule and dispatch generation or reductions in demand to meet a limit on Transmission Facilities different from that which the Office of the Interconnection has determined to be required for reliable operation of the Transmission System. To the extent consistent with its other obligations under this Agreement, the Office of the Interconnection shall schedule and dispatch generation and reductions in demand in accordance with such request. An entity that makes a request pursuant to this section 1.7.6(c) shall be responsible for all generation and other costs resulting from its request that would not have been incurred by operating the Transmission System and scheduling and dispatching generation in the manner that the Office of the Interconnection otherwise has determined to be required for reliable operation of the Transmission System.

1.7.7 Pricing.

The price paid for energy bought and sold in the PJM Interchange Energy Market and for demand reductions will reflect the hourly Locational Marginal Price at each load and generation bus, determined by the Office of the Interconnection in accordance with this Agreement. Transmission Congestion Charges and Transmission Loss Charges, which shall be determined by differences in Congestion Prices and Loss Prices in an hour, shall be calculated by the Office of the Interconnection, and collected by PJMSettlement, and the revenues therefrom shall be disbursed by PJMSettlement in accordance with this Schedule.

1.7.8 Generating Market Buyer Resources.

A Generating Market Buyer may elect to self-schedule its generation resources up to that Generating Market Buyer's Equivalent Load, in accordance with and subject to the procedures specified in this Schedule, and the accounting and billing requirements specified in Section 3 to this Schedule. PJMSettlement shall not be a contracting party with respect to such self-scheduled or self-supplied transactions.

1.7.9 Delivery to an External Market Buyer.

A purchase of Spot Market Energy by an External Market Buyer shall be delivered to a bus or busses at the electrical boundaries of the PJM Region specified by the Office of the Interconnection, or to load in such area that is not served by Network Transmission Service, using Point-to-Point Transmission Service paid for by the External Market Buyer. Further delivery of such energy shall be the responsibility of the External Market Buyer.

1.7.10 Other Transactions.

(a) Bilateral Transactions.

(i) In addition to transactions in the PJM Interchange Energy Market, Market Participants may enter into bilateral contracts for the purchase or sale of electric energy to or from each other or any other entity, subject to the obligations of Market Participants to make Generation Capacity Resources available for dispatch by the Office of the Interconnection. Such bilateral contracts shall be for the physical transfer of energy to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eSchedules and Enhanced Energy Scheduler tools.

(ii) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of energy to a Market Participant inside the PJM Region, title to the energy that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and the further transmission of the energy or further sale of the energy into the PJM Interchange Energy Market shall be transacted by the buyer under the bilateral contract. With respect to all bilateral contracts for the physical transfer of energy to an entity outside the PJM Region, title to the energy shall pass to the buyer at the border of the PJM Region and shall be delivered to the border using transmission service. In no event shall the purchase and sale of energy between Market Participants under a bilateral contract constitute a transaction in the PJM Interchange Energy Market or be construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.

(iii) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of energy reported to and coordinated with the Office of the Interconnection under this Schedule shall use all reasonable efforts, consistent with Good Utility Practice, to limit the megawatt hours of such reported transactions to amounts reflecting the expected load and other physical delivery obligations of the buyer under the bilateral contract.

(iv) All payments and related charges for the energy associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection or PJMSettlement. The LLC, PJMSettlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.

(v) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any Spot Market Backup used to meet the bilateral contract seller's obligation to deliver energy under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the

Interconnection shall (i) not accept any new eSchedules or Enhanced Energy Scheduler reporting by the Market Participant and (ii) terminate all of the Market Participant's eSchedules and Enhanced Energy Schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the eSchedules and Enhanced Energy Schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection. PJMSettlement shall assign its claims against a seller with respect to a seller's nonpayment for Spot Market Backup to a buyer to the extent that the buyer has made an indemnification payment to PJMSettlement with respect to the seller's nonpayment.

(vi) Bilateral contracts that do not contemplate the physical transfer of energy to or from a Market Participant are not subject to this Schedule, shall not be reported to and coordinated with the Office of the Interconnection, and shall not in any way constitute a transaction in the PJM Interchange Energy Market.

(b) Market Participants shall have Spot Market Backup with respect to all bilateral transactions that contemplate the physical transfer of energy to or from a Market Participant, that are not dynamically scheduled pursuant to Section 1.12 and that are curtailed or interrupted for any reason (except for curtailments or interruptions through active load management for load located within the PJM Region).

(c) To the extent the Office of the Interconnection dispatches a Generating Market Buyer's generation resources, such Generating Market Buyer may elect to net the output of such resources against its hourly Equivalent Load. Such a Generating Market Buyer shall be deemed a buyer from the PJM Interchange Energy Market to the extent of its PJM Interchange Imports, and shall be deemed a seller to the PJM Interchange Energy Market to the extent of its PJM Interchange Exports.

(d) A Market Seller may self-supply Station Power for its generation facility in accordance with the following provisions:

(i) A Market Seller may self-supply Station Power for its generation facility during any month (1) when the net output of such facility is positive, or (2) when the net output of such facility is negative and the Market Seller during the same month has available at other of its generation facilities positive net output in an amount at least sufficient to offset fully such negative net output. For purposes of this subsection (d), "net output" of a generation facility during any month means the facility's gross energy output, less the Station Power requirements of such facility, during that month. The determination of a generation facility's or a Market Seller's monthly net output under this subsection (d) will apply only to determine whether the Market Seller self-supplied Station Power during the month and will not affect the price of energy sold or consumed by the Market Seller at any bus during any hour during the month. For each hour when a Market Seller has positive net output and delivers energy into the Transmission System, it

will be paid the LMP at its bus for that hour for all of the energy delivered. Conversely, for each hour when a Market Seller has negative net output and has received Station Power from the Transmission System, it will pay the LMP at its bus for that hour for all of the energy consumed.

(ii) Transmission Provider will determine the extent to which each affected Market Seller during the month self-supplied its Station Power requirements or obtained Station Power from third-party providers (including affiliates) and will incorporate that determination in its accounting and billing for the month. In the event that a Market Seller self-supplies Station Power during any month in the manner described in subsection (1) of subsection (d)(i) above, Market Seller will not use, and will not incur any charges for, transmission service. In the event, and to the extent, that a Market Seller self-supplies Station Power during any month in the manner described in subsection (2) of subsection (d)(i) above (hereafter referred to as “remote self-supply of Station Power”), Market Seller shall use and pay for transmission service for the transmission of energy in an amount equal to the facility’s negative net output from Market Seller’s generation facility(ies) having positive net output. Unless the Market Seller makes other arrangements with Transmission Provider in advance, such transmission service shall be provided under Part II of the PJM Tariff and shall be charged the hourly rate under Schedule 8 of the PJM Tariff for Non-Firm Point-to-Point Transmission Service with an election to pay congestion charges, provided, however, that no reservation shall be necessary for such transmission service and the terms and charges under Schedules 1, 1A, 2 through 6, 9 and 10 of the PJM Tariff shall not apply to such service. The amount of energy that a Market Seller transmits in conjunction with remote self-supply of Station Power will not be affected by any other sales, purchases, or transmission of capacity or energy by or for such Market Seller under any other provisions of the PJM Tariff.

(iii) A Market Seller may self-supply Station Power from its generation facilities located outside of the PJM Region during any month only if such generation facilities in fact run during such month and Market Seller separately has reserved transmission service and scheduled delivery of the energy from such resource in advance into the PJM Region.

1.7.11 Emergencies.

(a) The Office of the Interconnection, with the assistance of the Members’ dispatchers as it may request, shall be responsible for monitoring the operation of the PJM Region, for declaring the existence of an Emergency, and for directing the operations of Market Participants as necessary to manage, alleviate or end an Emergency. The standards, policies and procedures of the Office of the Interconnection for declaring the existence of an Emergency, including but not limited to a Minimum Generation Emergency, and for managing, alleviating or ending an Emergency, shall apply to all Members on a non-discriminatory basis. Actions by the Office of the Interconnection and the Market Participants shall be carried out in accordance with this Agreement, the NERC Operating Policies, Applicable Regional Reliability Council reliability principles and standards, Good Utility Practice, and the PJM Manuals. A declaration that an Emergency exists or is likely to exist by the Office of the Interconnection shall be binding

on all Market Participants until the Office of the Interconnection announces that the actual or threatened Emergency no longer exists. Consistent with existing contracts, all Market Participants shall comply with all directions from the Office of the Interconnection for the purpose of managing, alleviating or ending an Emergency. The Market Participants shall authorize the Office of the Interconnection and PJM Settlement to purchase or sell energy on their behalf to meet an Emergency, and otherwise to implement agreements with other Control Areas interconnected with the PJM Region for the mutual provision of service to meet an Emergency, in accordance with this Agreement.

(b) To the extent load must be shed to alleviate an Emergency in a Control Zone, the Office of the Interconnection shall, to the maximum extent practicable, direct the shedding of load within such Control Zone. The Office of the Interconnection may shed load in one Control Zone to alleviate an Emergency in another Control Zone under its control only as necessary after having first shed load to the maximum extent practicable in the Control Zone experiencing the Emergency and only to the extent that PJM supports other control areas (not under its control) in those situations where load shedding would be necessary, such as to prevent isolation of facilities within the Eastern Interconnection, to prevent voltage collapse, or to restore system frequency following a system collapse; provided, however, that the Office of the Interconnection may not order a manual load dump in a Control Zone solely to address capacity deficiencies in another Control Zone. This section shall be implemented consistent with the North American Electric Reliability Council and applicable reliability council standards.

1.7.12 Fees and Charges.

Each Market Participant, except for Special Members, shall pay all fees and charges of the Office of the Interconnection for operation of the PJM Interchange Energy Market as determined by and allocated to the Market Participant by the Office of the Interconnection in accordance with Schedule 3.

1.7.13 Relationship to the PJM Region.

The PJM Interchange Energy Market operates within and subject to the requirements for the operation of the PJM Region.

1.7.14 PJM Manuals.

The Office of the Interconnection shall be responsible for maintaining, updating, and promulgating the PJM Manuals as they relate to the operation of the PJM Interchange Energy Market. The PJM Manuals, as they relate to the operation of the PJM Interchange Energy Market, shall conform and comply with this Agreement, NERC operating policies, and Applicable Regional Reliability Council reliability principles, guidelines and standards, and shall be designed to facilitate administration of an efficient energy market within industry reliability standards and the physical capabilities of the PJM Region.

1.7.15 Corrective Action.

Consistent with Good Utility Practice, the Office of the Interconnection shall be authorized to direct or coordinate corrective action, whether or not specified in the PJM Manuals, as necessary to alleviate unusual conditions that threaten the integrity or reliability of the PJM Region, or the regional power system.

1.7.16 Recording.

Subject to the requirements of applicable State or federal law, all voice communications with the Office of the Interconnection Control Center may be recorded by the Office of the Interconnection and any Market Participant communicating with the Office of the Interconnection Control Center, and each Market Participant hereby consents to such recording.

1.7.17 Operating Reserves.

(a) The following procedures shall apply to any generation unit subject to the dispatch of the Office of the Interconnection for which construction commenced before July 9, 1996, or any Demand Resource subject to the dispatch of the Office of the Interconnection.

(b) The Office of the Interconnection shall schedule to the Operating Reserve and load-following objectives of the Control Zones of the PJM Region and the PJM Interchange Energy Market in scheduling generation resources and/or Demand Resources pursuant to this Schedule. A table of Operating Reserve objectives for each Control Zone is calculated and published annually in the PJM Manuals. Reserve levels are probabilistically determined based on the season's historical load forecasting error and forced outage rates.

(c) Nuclear generation resources shall not be eligible for Operating Reserve payments unless: 1) the Office of the Interconnection directs such resources to reduce output, in which case, such units shall be compensated in accordance with section 3.2.3(f) of this Schedule; or 2) the resource submits a request for a risk premium to the Market Monitoring Unit under the procedures specified in Section II.B of Attachment M - Appendix. A nuclear generation resource (i) must submit a risk premium consistent with its agreement under such process, or, (ii) if it has not agreed with the Market Monitoring Unit on an appropriate risk premium, may submit its own determination of an appropriate risk premium to the Office of the Interconnection, subject to acceptance by the Office of the Interconnection, with or without prior approval from the Commission.

(d) PJMSettlement shall be the Counterparty to the purchases and sales of Operating Reserve in the PJM Interchange Energy Market.

1.7.18 Regulation.

(a) Regulation to meet the Regulation objective of each Regulation Zone shall be supplied from generation resources and/or Demand Resources located within the metered electrical boundaries of such Regulation Zone. Generating Market Buyers, and Market Sellers offering Regulation, shall comply with applicable standards and requirements for Regulation capability and dispatch specified in the PJM Manuals.

(b) The Office of the Interconnection shall obtain and maintain for each Regulation Zone an amount of Regulation equal to the Regulation objective for such Regulation Zone as specified in the PJM Manuals.

(c) The Regulation range of a generation unit or Demand Resource shall be at least twice the amount of Regulation assigned.

(d) A generation unit capable of automatic energy dispatch that is also providing Regulation shall have its energy dispatch range reduced by twice the amount of the Regulation provided. The amount of Regulation provided by a generation unit shall serve to redefine the Normal Minimum Generation and Normal Maximum Generation energy limits of that generation unit, in that the amount of Regulation shall be added to the generation unit's Normal Minimum Generation energy limit, and subtracted from its Normal Maximum Generation energy limit.

(e) Qualified Regulation must satisfy the verification tests described in the PJM Manuals.

1.7.19 Ramping.

A generator dispatched by the Office of the Interconnection pursuant to a control signal appropriate to increase or decrease the generator's megawatt output level shall be able to change output at the ramping rate specified in the Offer Data submitted to the Office of the Interconnection for that generator.

1.7.19A Synchronized Reserve.

(a) Synchronized Reserve shall be supplied from generation resources and/or Demand Resources located within the metered boundaries of the PJM Region. Generating Market Buyers, and Market Sellers offering Synchronized Reserve shall comply with applicable standards and requirements for Synchronized Reserve capability and dispatch specified in the PJM Manuals

(b) The Office of the Interconnection shall obtain and maintain for each Synchronized Reserve Zone an amount of Synchronized Reserve equal to the Synchronized Reserve objective for such Synchronized Reserve Zone, as specified in the PJM Manuals.

(c) The Synchronized Reserve capability of a generation resource and Demand Resource shall be the increase in energy output or load reduction achievable by the generation resource and Demand Resource within a continuous 10-minute period.

(d) A generation unit capable of automatic energy dispatch that also is providing Synchronized Reserve shall have its energy dispatch range reduced by the amount of the Synchronized Reserve provided. The amount of Synchronized Reserve provided by a generation unit shall serve to redefine the Normal Maximum Generation energy limit of that generation unit

in that the amount of Synchronized Reserve provided shall be subtracted from its Normal Maximum Generation energy limit.

1.7.19B Bilateral Transactions Regarding Regulation, Synchronized Reserve and Day-ahead Scheduling Reserves.

(a) In addition to transactions in the Regulation market, Synchronized Reserve market, and Day-ahead Scheduling Reserves Market, Market Participants may enter into bilateral contracts for the purchase or sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from each other or any other entity. Such bilateral contracts shall be for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eMarket tools.

(b) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to a Market Participant in the PJM Region, title to the product that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and any further transactions associated with such products or further sale of such Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves in the markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, respectively, shall be transacted by the buyer under the bilateral contract. In no event shall the purchase and sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves between Market Participants under a bilateral contract constitute a transaction in PJM's markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, or otherwise be construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.

(c) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves reported to and coordinated with the Office of the Interconnection under this Schedule shall use all reasonable efforts, consistent with Good Utility Practice, to limit the amounts of such reported transactions to amounts reflecting the expected requirements for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves of the buyer pursuant to such bilateral contracts.

(d) All payments and related charges for the Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection. The LLC, PJMSettlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.

(e) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any purchases by the seller under the bilateral contract in the markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling

Reserves used to meet the bilateral contract seller's obligation to deliver Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the Interconnection shall (i) not accept any new eMarket reporting by the Market Participant and (ii) terminate all of the Market Participant's reporting of eMarkets schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the reported eMarkets schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection.

(f) Market Participants shall purchase Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves from PJM's markets for Regulation, Synchronized Reserve, Day-ahead Scheduling Reserves, in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason, with respect to all bilateral transactions that contemplate the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant.

1.7.20 Communication and Operating Requirements.

(a) Market Participants. Each Market Participant shall have, or shall arrange to have, its transactions in the PJM Interchange Energy Market subject to control by a Market Operations Center, with staffing and communications systems capable of real-time communication with the Office of the Interconnection during normal and Emergency conditions and of control of the Market Participant's relevant load or facilities sufficient to meet the requirements of the Market Participant's transactions with the PJM Interchange Energy Market, including but not limited to the following requirements as applicable.

(b) Market Sellers selling from generation resources and/or Demand Resources within the PJM Region shall: report to the Office of the Interconnection sources of energy and Demand Resources available for operation; supply to the Office of the Interconnection all applicable Offer Data; report to the Office of the Interconnection generation resources that are self-scheduled; with respect to generation resources, report to the Office of the Interconnection bilateral sales transactions to buyers not within the PJM Region; confirm to the Office of the Interconnection bilateral sales to Market Buyers within the PJM Region; respond to the Office of the Interconnection's directives to start, shutdown or change output levels of generation units, or change scheduled voltages or reactive output levels of generation units, or reduce load from Demand Resources; continuously maintain all Offer Data concurrent with on-line operating information; and ensure that, where so equipped, generating equipment and Demand Resources are operated with control equipment functioning as specified in the PJM Manuals.

(c) Market Sellers selling from generation resources outside the PJM Region shall: provide to the Office of the Interconnection all applicable Offer Data, including offers specifying

amounts of energy available, hours of availability and prices of energy and other services; respond to Office of the Interconnection directives to schedule delivery or change delivery schedules; and communicate delivery schedules to the Market Seller's Control Area.

(d) Market Participants that are Load Serving Entities or purchasing on behalf of Load Serving Entities shall: respond to Office of the Interconnection directives for load management steps; report to the Office of the Interconnection Generation Capacity Resources to satisfy capacity obligations that are available for pool operation; report to the Office of the Interconnection all bilateral purchase transactions; respond to other Office of the Interconnection directives such as those required during Emergency operation.

(e) Market Participants that are not Load Serving Entities or purchasing on behalf of Load Serving Entities shall: provide to the Office of the Interconnection requests to purchase specified amounts of energy for each hour of the Operating Day during which it intends to purchase from the PJM Interchange Energy Market, along with Dispatch Rate levels above which it does not desire to purchase; respond to other Office of the Interconnection directives such as those required during Emergency operation.

(f) Economic Load Response Participants are responsible for maintaining demand reduction information, including the amount and price at which demand may be reduced. The Economic Load Response Participant shall provide this information to the Office of the Interconnection by posting it on the Load Response Program Registration link of the PJM website as required by the PJM Manuals. The Economic Load Response Participant shall notify the Office of the Interconnection of a demand reduction concurrent with, or prior to, the beginning of such demand reduction in accordance with the PJM Manuals. In the event that an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer that would affect a relevant Customer Baseline Load as required by the PJM Manuals.

2.2 General.

The Office of the Interconnection shall determine the least cost security-constrained dispatch, which is the least costly means of serving load at different locations in the PJM Region based on actual operating conditions existing on the power grid (including transmission constraints on external coordinated flowgates to the extent provided by section 1.7.6) and on the prices at which Market Sellers have offered to supply energy and offers by Economic Load Response Participants to reduce demand that qualify to set Locational Marginal Prices in the PJM Interchange Energy Market. Locational Marginal Prices for the generation and load busses in the PJM Region, including interconnections with other Control Areas, will be calculated based on the actual economic dispatch and the prices of energy and demand reduction offers. The process for the determination of Locational Marginal Prices shall be as follows:

(a) To determine actual operating conditions on the power grid in the PJM Region, the Office of the Interconnection shall use a computer model of the interconnected grid that uses available metered inputs regarding generator output, loads, and power flows to model remaining flows and conditions, producing a consistent representation of power flows on the network. The computer model employed for this purpose, referred to as the State Estimator program, is a standard industry tool and is described in Section 2.3 below. It will be used to obtain information regarding the output of generation supplying energy to the PJM Region, loads at busses in the PJM Region, transmission losses, and power flows on binding transmission constraints for use in the calculation of Locational Marginal Prices. Additional information used in the calculation, including Dispatch Rates and real time schedules for external transactions between PJM and other Control Areas and dispatch and pricing information from entities with whom PJM has executed a joint operating agreement, will be obtained from the Office of the Interconnection's dispatchers.

(b) Using the prices at which energy is offered by Market Sellers and demand reductions are offered by Economic Load Response Participants to the PJM Interchange Energy Market, the Office of the Interconnection shall determine the offers of energy and demand reductions that will be considered in the calculation of Locational Marginal Prices. As described in Section 2.4 below, every qualified offer for demand reduction and of energy by a Market Seller from resources that are following economic dispatch instructions of the Office of the Interconnection will be utilized in the calculation of Locational Marginal Prices, including, without limitation, qualified offers from Economic Load Response Participants in either the Day-Ahead or Real-Time Energy Markets that satisfy the Net Benefits Test. Offers of demand reduction from Demand Resources in the Real-time Energy Market will not be eligible to set Locational Marginal Prices, unless metered directly by the Office of the Interconnection.

(c) Based on the system conditions on the PJM power grid, determined as described in (a), and the eligible energy and demand reduction offers, determined as described in (b), the Office of the Interconnection shall determine the least costly means of obtaining energy to serve the next increment of load at each bus in the PJM Region, in the manner described in Section 2.5 below. The result of that calculation shall be a set of Locational Marginal Prices based on the system conditions at the time.

3.2 Market Buyers.

3.2.1 Spot Market Energy Charges.

(a) The Office of the Interconnection shall calculate System Energy Prices in the form of Day-ahead System Energy Prices and Real-time System Energy Prices for the PJM Region, in accordance with Section 2 of this Schedule

(b) Market Buyers shall be charged for all load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) scheduled to be served from the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price .

(c) Generating Market Buyers shall be paid for all energy scheduled to be delivered to the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price.

(d) At the end of each hour during an Operating Day, the Office of the Interconnection shall calculate the total amount of net hourly PJM Interchange for each Market Buyer, including Generating Market Buyers, in accordance with the PJM Manuals. For Internal Market Buyers that are Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall include determination of the net energy flows from: (i) tie lines; (ii) any generation resource the output of which is controlled by the Market Buyer but delivered to it over another entity's Transmission Facilities; (iii) any generation resource the output of which is controlled by another entity but which is directly interconnected with the Market Buyer's transmission system; (iv) deliveries pursuant to bilateral energy sales; (v) receipts pursuant to bilateral energy purchases; and (vi) an adjustment to account for the day-ahead PJM Interchange, calculated as the difference between scheduled withdrawals and injections by that Market Buyer in the Day-ahead Energy Market. For External Market Buyers and Internal Market Buyers that are not Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall determine the energy scheduled hourly for delivery to the Market Buyer net of the amounts scheduled by the External Market Buyer in the Day-ahead Energy Market.

(e) An Internal Market Buyer shall be charged for Spot Market Energy purchases to the extent of its hourly net purchases from the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. An External Market Buyer shall be charged for its Spot Market Energy purchases based on the energy delivered to it, determined as specified in Section 3.2.1(d) above. The total charge shall be determined by the product of the hourly net amount of PJM Interchange Imports times the hourly Real-time System Energy Price for that Market Buyer.

(f) A Generating Market Buyer shall be paid as a Market Seller for sales of Spot Market Energy to the extent of its hourly net sales into the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. The total payment shall be determined by the product of the hourly net amount of PJM Interchange Exports times the hourly Real-time System Energy Price for that Market Seller.

3.2.2 Regulation.

(a) Each Internal Market Buyer that is a Load Serving Entity in a Regulation Zone shall have an hourly Regulation objective equal to its pro rata share of the Regulation requirements of such Regulation Zone for the hour, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Regulation Zone for the hour ("Regulation Obligation"). An Internal Market Buyer that does not meet its hourly Regulation obligation shall be charged for Regulation dispatched by the Office of the Interconnection to meet such obligation at the Regulation market-clearing price determined in accordance with subsection (c) of this section, plus the amounts, if any, described in subsection (f) of this section.

(b) A Generating Market Buyer supplying Regulation in a Regulation Zone at the direction of the Office of the Interconnection in excess of its hourly Regulation obligation shall be credited for each increment of such Regulation at the higher of (i) the Regulation market-clearing price in such Regulation Zone or (ii) the sum of the regulation offer and the unit-specific opportunity cost of the generation resource supplying the increment of Regulation, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(c) The Regulation market-clearing price in each Regulation Zone shall be determined at a time to be determined by the Office of the Interconnection which shall be no earlier than the day before the Operating Day. The market-clearing price for each regulating hour shall be equal to the highest sum of a resource's Regulation offer plus its estimated unit-specific opportunity costs, determined as described in subsection (d) below from among the resources selected to provide Regulation. A resource's Regulation offer by any Market Seller that fails the three-pivotal supplier test set forth in section 3.3.2A.1 of this Schedule shall not exceed the cost of providing Regulation from such resource, plus twelve dollars, as determined pursuant to the formula in section 1.10.1A(e) of this Schedule.

(d) In determining the Regulation market-clearing price for each Regulation Zone, the estimated unit-specific opportunity costs of a generation resource offering to sell Regulation in each regulating hour shall be equal to the sum of the unit-specific opportunity costs (i) incurred during the hour in which the obligation is fulfilled, plus costs (ii) associated with uneconomic operation during the hour preceding the initial regulating hour ("preceding shoulder hour"), plus costs (iii) associated with uneconomic operation during the hour after the final regulating hour ("following shoulder hour").

The unit-specific opportunity costs incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the set point of the generation resource that is expected to be required in order to provide Regulation from the generation resource's expected output level if it had been dispatched in economic merit order times, (ii) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource) in the PJM Interchange Energy Market.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (a) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to provide Regulation and the resource's expected output during the preceding shoulder hour, times (b) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource during the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (c) the percentage of the preceding shoulder hour during which the deviation was incurred.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (a) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the resource's expected output in the following shoulder hour, times (b) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market, times (c) the percentage of the following shoulder hour that the deviation was incurred.

Estimated opportunity costs for Demand Resources to provide Regulation are zero.

(e) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Regulation in a Regulation Zone and that actively follows the Office of the Interconnection's Regulation signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Regulation, and for the percentage of the preceding shoulder hour and the following shoulder hour during which the Generating Market Buyer or Market Seller provided Regulation. The unit-specific opportunity cost incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's Regulation signals from the generation resource's expected output level if it had been dispatched in economic merit order times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the actual megawatt level of the resource when the actual megawatt level is within the tolerance defined in the PJM Manuals for the Regulation set point, or at the Regulation set point for the resource when it is not within the corresponding tolerance) in the PJM Interchange Energy Market. Opportunity costs for Demand Resources to provide Regulation are zero.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to

provide Regulation and the lesser of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the preceding shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the following shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the following shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the following shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(f) Any amounts credited for Regulation in an hour in excess of the Regulation market-clearing price in that hour shall be allocated and charged to each Internal Market Buyer in a Regulation Zone that does not meet its hourly Regulation obligation in proportion to its purchases of Regulation in such Regulation Zone in megawatt-hours during that hour.

3.2.2A Offer Price Caps.

3.2.2A.1 Applicability.

(a) Each hour, the Office of the Interconnection shall conduct a three-pivotal supplier test as described in this section. Regulation offers from Market Sellers that fail the three-pivotal supplier test shall be capped in the hour in which they failed the test at their cost based offers as determined pursuant to section 1.10.1A(e) of this Schedule. A Regulation supplier fails the three-pivotal supplier test in any hour in which such Regulation supplier and the two largest other Regulation suppliers are jointly pivotal.

(b) For the purposes of conducting the three-pivotal supplier test pursuant to this section, the following applies:

(i) The three-pivotal supplier test will include in the definition of available supply all offers from resources capable of satisfying the Regulation requirement of the PJM Region for which the cost-based offer plus any eligible opportunity costs is no greater than 150 percent of the clearing price that would be calculated if all offers were limited to cost (plus eligible opportunity costs).

(ii) The three-pivotal supplier test will apply on a Regulation supplier basis (i.e. not a resource by resource basis) and only the Regulation suppliers that fail the three-pivotal supplier test will have their Regulation offers capped. A Regulation supplier for the purposes of this section includes corporate affiliates. Regulation from resources controlled by a Regulation supplier or its affiliates, whether by contract with unaffiliated third parties or otherwise, will be included as Regulation of that Regulation supplier. Regulation provided by resources owned by a Regulation supplier but controlled by an unaffiliated third party, whether by contract or otherwise, will be included as Regulation of that third party.

3.2.3 Operating Reserves.

(a) A Market Seller's pool-scheduled resources capable of providing Operating Reserves shall be credited as specified below based on the prices offered for the operation of such resource, provided that the resource was available for the entire time specified in the Offer Data for such resource. To the extent that Section 3.2.A.01 of Schedule 1 of this Agreement does not meet the Day-ahead Scheduling Reserves Requirement, the Office of the Interconnection shall schedule additional Operating Reserves pursuant to Section 1.7.17 and 1.10 of Schedule 1 of this Agreement. In addition the Office of the Interconnection shall schedule Operating Reserves pursuant to those sections to satisfy any unforeseen Operating Reserve requirements that are not reflected in the Day-ahead Scheduling Reserves Requirement.

(b) The following determination shall be made for each pool-scheduled resource that is scheduled in the Day-ahead Energy Market: the total offered price for start-up and no-load fees and energy, determined on the basis of the resource's scheduled output, shall be compared to the total value of that resource's energy – as determined by the Day-ahead Energy Market and the Day-ahead Prices applicable to the relevant generation bus in the Day-ahead Energy Market. Except as provided in Section 3.2.3(n), if the total offered price summed over all hours exceeds the total value summed over all hours, the difference shall be credited to the Market Seller. The Office of the Interconnection shall apply any balancing Operating Reserve credits allocated pursuant to this Section 3.2.3(b) to real-time deviations from day-ahead schedules or real-time load share plus exports, pursuant to Section 3.2.3(p), depending on whether the balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

(i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve

credits shall be allocated based on the reason the resource was scheduled according to the following provisions:

(A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve credits, identified as RA Credits for Deviations, shall be allocated to real-time deviations from day-ahead schedules.

(B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve credits, identified as RA Credits for Reliability, shall be allocated according to ratio share of real time load plus export transactions.

(C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve credits shall be segmented and separately allocated pursuant to subsections 3.2.3(b)(i)(A) or 3.2.3(b)(i)(B) hereof. Balancing Operating Reserve credits for such resources will be identified in the same manner as units committed during the reliability analysis pursuant to subsections 3.2.3(b)(i)(A) and 3.2.3(b)(i)(B) hereof.

(ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve credits shall be allocated according to the following provisions:

(A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve credits, identified as RT Credits for Reliability, shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, credits will be applied pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the credits for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category (RT Credits for Reliability or RT Credits for Deviations) as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(b)(ii)(A) hereof to operate in real-time during an Operating Day, the associated balancing Operating Reserve credits, identified as RT Credits for Deviations, shall be allocated according to real-time deviations from day-ahead schedules.

(iii) PJM shall post on its Web site the aggregate amount of MWs committed that meet the criteria referenced in subsections (b)(i) and (b)(ii) hereof.

(c) The sum of the foregoing credits calculated in accordance with Section 3.2.3(b) plus any unallocated charges from Section 3.2.3(h) and 5.1.7 and any shortfalls paid pursuant to the Market Settlement provision of the Day-ahead Economic Load Response Program, shall be the cost of Operating Reserves in the Day-ahead Energy Market.

(d) The cost of Operating Reserves in the Day-ahead Energy Market shall be allocated and charged to each Market Participant in proportion to the sum of its (i) scheduled load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) and accepted Decrement Bids in the Day-ahead Energy Market in megawatt-hours for that Operating Day; and (ii) scheduled energy sales in the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours for that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such area pursuant to Section 1.12.

(e) At the end of each Operating Day, the following determination shall be made for each synchronized pool-scheduled resource of each Market Seller that operates as requested by the Office of the Interconnection and that is not committed solely for the purpose of providing Synchronized Reserve: For each calendar day, pool-scheduled resources in the Real-time Energy Market shall be made whole for each of the following segments: 1) the greater of their day-ahead schedules or minimum run time (minimum down time for Demand Resources); and 2) any block of hours the resource operates at PJM's direction in excess of the greater of its day-ahead schedule or minimum run time (minimum down time for Demand Resources). For each calendar day, and for each synchronized start of a generation resource or PJM-dispatched economic load reduction, there will be a maximum of two segments for each resource. Segment 1 will be the greater of the day-ahead schedule and minimum run time (minimum down time for Demand Resources) and Segment 2 will include the remainder of the contiguous hours when the resource is operating at the direction of the Office of the Interconnection, provided that a segment is limited to the Operating Day in which it commenced and cannot include any part of the following Operating Day.

Credits received pursuant to this section shall be equal to the positive difference between a resource's total offered price for start-up (shutdown costs for Demand Resources) and no-load fees and energy, determined on the basis of the resource's scheduled output, and the total value of the resource's energy as determined by the Real-time Energy Market and the real-time LMP(s) applicable to the relevant generation bus in the Real-time Energy Market. The foregoing notwithstanding, credits for segment 2 shall exclude start up (shutdown costs for Demand Resources) costs for generation resources.

Except as provided in Section 3.2.3(m), if the total offered price exceeds the total value, the difference less any credit as determined pursuant to Section 3.2.3(b) plus the resource's opportunity cost and less any amounts credited for Synchronized Reserve in excess of the Synchronized Reserve offer plus the resource's opportunity cost and less any amounts credited for Reactive Services as specified in Section 3.2.3.B, and less any amounts for Day-ahead Scheduling Reserve in excess of the Day-ahead Scheduling Reserve offer plus the resource's opportunity cost, shall be credited to the Market Seller.

Synchronized Reserve and Day-ahead Scheduling Reserve credits applied against Operating Reserve credits pursuant to this section shall be netted against the Operating Reserve credits earned in the corresponding hour(s) in which the Synchronized Reserve and Day-ahead Scheduling Reserve credits accrued, provided that for condensing combustion turbines, Synchronized Reserve credits will be netted against the total Operating Reserve credits accrued during each period the unit operates in condensing and generation mode for one or more contiguous hours.

(f) A Market Seller's steam-electric generating unit or combined cycle unit operating in combined cycle mode that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is reduced or suspended at the request of the Office of the Interconnection due to a transmission constraint or other reliability issue, and for which the hourly integrated, real-time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall be credited hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$, where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended, determined according to the real-time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(f-1) A Market Seller's combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool-scheduled (or self-scheduled, if operating according to Section

1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

(i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as directed by the PJM dispatcher), then the Market Seller shall be credited in a manner consistent with that described above for a steam unit or combined cycle unit operating in combined cycle mode.

(ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

URTLMP equals the real time LMP at the unit's bus;

UDALMP equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit, determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(f-2) A Market Seller's hydroelectric resource that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is altered at the request of the Office of the Interconnection from the schedule submitted by the owner, due to a transmission constraint or other reliability issue, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(f-3) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for opportunity cost associated with following PJM dispatch instructions and reducing or suspending a unit's output due to a transmission constraint or other reliability issue, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of opportunity cost compensation, the Office of the Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit

disagrees with the modified amount of opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(g) The sum of the foregoing credits, plus any cancellation fees paid in accordance with Section 1.10.2(d) such cancellation fees to be applied to the Operating Day for which the unit was scheduled, plus any shortfalls paid pursuant to the Market Settlement provision of the real-time Economic Load Response Program, less any payments received from another Control Area for Operating Reserves, plus any redispatch costs incurred in accordance with section 10(a) of this Schedule, shall be the cost of Operating Reserves for the Real-time Energy Market in each Operating Day.

(h) The cost of Operating Reserves for the Real-time Energy Market for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of the absolute values of its (i) load deviations (net of operating Behind The Meter Generation) from the Day-ahead Energy Market in megawatt-hours during that Operating Day, except as noted below and in the PJM Manuals; (ii) generation deviations (not including deviations in Behind The Meter Generation) from the Day-ahead Energy Market for non-dispatchable generation resources, including External Resources, in megawatt-hours during the Operating Day; (iii) deviations from the Day-ahead Energy Market for bilateral transactions from outside the PJM Region for delivery within such region in megawatt-hours during the Operating Day; and (iv) deviations of energy sales from the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such area pursuant to Section 1.12.

Deviations that occur within a single Zone shall be associated with the Eastern or Western Regions, as defined in Section 3.2.3(q) of this Schedule, and shall be subject to the regional balancing Operating Reserve rate determined in accordance with Section 3.2.3(q). Deviations at interfaces and hubs shall be associated with the Eastern or Western Region if all the busses that define all interfaces or all hubs are located in the region. If deviations at interfaces and hubs are associated with the Eastern or Western region, they shall be subject to the regional balancing Operating Reserve rate. Demand and supply deviations shall be based on total activity in a Zone, including all aggregates and hubs defined by busses that are wholly contained within the same Zone.

The foregoing notwithstanding, netting deviations shall be allowed in accordance with the following provisions:

(i) Generation resources with multiple units located at a single bus shall be able to offset deviations in accordance with the PJM Manuals to determine the net deviation MW at the relevant bus.

(ii) Demand deviations will be assessed by comparing all day-ahead demand transactions at a single transmission zone, hub, or interface against the real-time demand transactions at that same transmission zone, hub, or interface; except that the positive values of demand deviations, as set forth in the PJM Manuals, will not be assessed

Operating Reserve charges in the event of an Operating Reserve shortage in real-time or where PJM initiates the request for load reductions in real-time in order to avoid an Operating Reserve shortage as described in this Schedule, Section 6A, Scarcity Pricing.

(iii) Supply deviations will be assessed by comparing all day-ahead transactions at a single transmission zone, hub, or interface against the real-time transactions at that same transmission zone, hub, or interface.

(i) At the end of each Operating Day, Market Sellers shall be credited on the basis of their offered prices for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, as well as the credits calculated as specified in Section 3.2.3(b) for those generators committed solely for the purpose of providing synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, at the request of the Office of the Interconnection.

(j) The sum of the foregoing credits as specified in Section 3.2.3(i) shall be the cost of Operating Reserves for synchronous condensing for the PJM Region for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for the Operating Day and shall be separately determined for each Control Zone of the PJM Region based on the Control Zone to which the resource was synchronized to provide synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation.

(k) The cost of Operating Reserves for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of its (i) deliveries of energy to load (net of operating Behind The Meter Generation, but not to be less than zero) in the PJM Region, served under Network Transmission Service, in megawatt-hours during that Operating Day; and (ii) deliveries of energy sales from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such Control Zone pursuant to Section 1.12, as compared to the sum of all such deliveries for all Market Participants.

(l) For any Operating Day in either, as applicable, the Day-ahead Energy Market or the Real-time Energy Market for which, for all or any part of such Operating Day, the Office of the Interconnection: (i) declares a Maximum Generation Emergency; (ii) issues an alert that a Maximum Generation Emergency may be declared (“Maximum Generation Emergency Alert”); or (iii) schedules units based on the anticipation of a Maximum Generation Emergency or a Maximum Generation Emergency Alert, the Operating Reserves credit otherwise provided by Section 3.2.3.(b) or Section 3.2.3(e) in connection with market-based offers shall be limited as provided in subsections (n) or (m), respectively. The Office of the Interconnection shall provide timely notice on its internet site of the commencement and termination of any of the actions described in subsection (i), (ii), or (iii) of this subsection (l) (collectively referred to as “MaxGen Conditions”). Following the posting of notice of the commencement of a MaxGen Condition, a Market Seller may elect to submit a cost-based offer in accordance with Schedule 2 of the

Operating Agreement, in which case subsections (m) and (n) shall not apply to such offer; provided, however, that such offer must be submitted in accordance with the deadlines in Section 1.10 for the submission of offers in the Day-ahead Energy Market or Real-time Energy Market, as applicable. Submission of a cost-based offer under such conditions shall not be precluded by Section 1.9.7(b); provided, however, that the Market Seller must return to compliance with Section 1.9.7(b) when it submits its bid for the first Operating Day after termination of the MaxGen Condition.

(m) For the Real-time Energy Market, if the Effective Offer Price (as defined below) for a market-based offer is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. For purposes of this subsection (m), the Effective Offer Price shall be the amount that, absent subsections (l) and (m), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(e) plus the Real-time Energy Market revenues for the hours that the offer is economic divided by the megawatt hours of energy provided during the hours that the offer is economic. The hours that the offer is economic shall be: (i) the hours that the offer price for energy is less than or equal to the Real-time Price for the relevant generation bus, (ii) the hours in which the offer for energy is greater than Locational Marginal Price and the unit is operated at the direction of the Office of the Interconnection that are in addition to any hours required due to the minimum run time or other operating constraint of the unit, and (iii) for any unit with a minimum run time of one hour or less and with more than one start available per day, any hours the unit operated at the direction of the Office of the Interconnection.

(n) For the Day-ahead Energy Market, if notice of a MaxGen Condition is provided prior to 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. If notice of a MaxGen Condition is provided after 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. If the Effective Offer Price is less than or equal to \$1,000/MWh, regardless of when notice of a MaxGen Condition is provided, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. For purposes of this subsection (n), the Effective Offer Price shall be the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day divided by the megawatt hours of energy offered during the Specified Hours, plus the offer for energy during such hours. The Specified Hours shall be the lesser of: (1) the minimum run hours stated by the Market Seller in its Offer Data; and (2) either (i) for steam-electric generating units and for combined-cycle units when such units are operating in combined-cycle mode, the six consecutive hours of highest Day-ahead Price during such Operating Day when such units are running or (ii) for combustion turbine units and for combined-cycle units when such units are operating in combustion turbine mode, the two consecutive hours of highest Day-ahead Price during such Operating Day when such units are running. Notwithstanding any other provision in this subsection, the total compensation to a Market Seller on any Operating Day that includes a MaxGen Condition shall not exceed \$1,000/MWh during the Specified Hours, where such total compensation in each such hour is

defined as the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(b) divided by the Specified Hours, plus the Day-ahead Price for such hour, and no Operating Reserves payments shall be made for any other hour of such Operating Day. If a unit operates in real time at the direction of the Office of the Interconnection consistently with its day-ahead clearing, then subsection (m) does not apply.

(o) Dispatchable pool-scheduled generation resources and dispatchable self-scheduled generation resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Pool-scheduled generation resources and dispatchable self-scheduled generation resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations in accordance with the calculations described in the PJM Manuals. Ramp-limited desired MW values shall be used to determine generation resource real-time deviations from the resource's day-ahead schedules.

The Office of the Interconnection shall calculate a ramp-limited desired MW value for generation resources where the economic minimum and economic maximum are at least as far apart in real-time as they are in day-ahead according to the following parameters:

(i) real-time economic minimum $\leq$ 105% of day-ahead economic minimum or day-ahead economic minimum plus 5 MW, whichever is greater.

(ii) real-time economic maximum $\geq$ 95% day-ahead economic maximum or day-ahead economic maximum minus 5 MW, whichever is lower.

The ramp-limited desired MW value for a generation resource shall be equal to:

$$\text{Ramp\_Request}_t = \frac{(\text{UDS\_target}_{t-1} - \text{AOutput}_{t-1})}{(\text{UDSL\_time}_{t-1})}$$

$$\text{RL\_Desired}_t = \text{AOutput}_{t-1} + \left(\text{Ramp\_Request}_t * \text{Case\_Eff\_time}_{t-1} \right)$$

where:

1. UDS_target = UDS basepoint for the previous UDS case
2. AOutput = Unit's output at case solution time
3. UDSL_time = UDS look ahead time
4. Case_Eff_time = Time between base point changes
5. RL_Desired = Ramp-limited desired MW

To determine if a generation resource is following dispatch the Office of the Interconnection shall determine the unit's MW off dispatch and % off dispatch by using the lesser of the difference between the actual output and the UDS Basepoint or the actual output and ramp-limited desired MW value. The % off dispatch and MW off dispatch will be a time-weighted average over the course of an hour.

A pool-scheduled or dispatchable self-scheduled resource is considered to be following dispatch if its actual output is between its ramp-limited desired MW value and UDS Basepoint, or if its % off dispatch is ≤ 10 , or its hourly integrated Real-time MWh is within 5% or 5 MW (whichever is greater) of the hourly integrated ramp-limited desired MW. A self-scheduled generator must also be dispatched above economic minimum. The degree of deviations for resources that are not following dispatch shall be determined in accordance with the following provisions:

- A dispatchable self-scheduled resource that is not dispatched above economic minimum shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – Day-Ahead MWh.
- A resource that is dispatchable day-ahead but is Fixed Gen in real-time shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – UDS LMP Desired MW.
- Pool-scheduled generators that are not following dispatch shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW.
- If a resource's real-time economic minimum is greater than its day-ahead economic minimum by 5% or 5 MW, whichever is greater, or its real-time economic maximum is less than its Day Ahead economic maximum by 5% or 5 MW, whichever is lower, and UDS LMP Desired MWh for the hour is either below the real time economic minimum or above the real time economic maximum, then balancing Operating Reserve deviations for the resource shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch and its % Off Dispatch is $\leq 20\%$, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW. If deviation value is within 5% or 5 MW (whichever is greater) of Ramp-Limited Desired MW, balancing Operating Reserve deviations shall not be assessed.
- If a resource is not following dispatch and its % off Dispatch is $> 20\%$, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch, and the resource has tripped, for the hour the resource tripped and the hours it remains offline throughout its day-ahead schedule balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – Day-Ahead MWh.
- For resources that are not dispatchable in both the Day-Ahead and Real-time Energy Markets balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh and Day-Ahead MWh.

(o-1) Dispatchable economic load reduction resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Economic load reduction resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations as described in this subsection and as further specified in the PJM Manuals.

The Desired MW quantity for such resources for each hour shall be the hourly integrated MW quantity to which the load reduction resource was dispatched for each hour (where the hourly integrated value is the average of the dispatched values as determined by the Office of the Interconnection for the resource for each hour).

If the actual reduction quantity for the load reduction resource for a given hour deviates by no more than 20% above or below the Desired MW quantity, then no balancing Operating Reserve deviation will accrue for that hour. If the actual reduction quantity for the load reduction resource for a given hour is outside the 20% bandwidth, the balancing Operating Reserve deviations will accrue for that hour in the amount of the absolute value of (Desired MW – actual reduction quantity). For those hours where the actual reduction quantity is within the 20% bandwidth specified above, the load reduction resource will be eligible to be made whole for the total value of its offer as defined in section 3.3A of this Appendix. Hours for which the actual reduction quantity is outside the 20% bandwidth will not be eligible for the make-whole payment. If at least one hour is not eligible for make-whole payment based on the 20% criteria, then the resource will also not be made whole for its shutdown cost.

(p) The Office of the Interconnection shall allocate the charges assessed pursuant to Section 3.2.3(h) of Schedule 1 of this Agreement to real-time deviations from day-ahead schedules or real-time load share plus exports depending on whether the underlying balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

(i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve charges shall be allocated based on the reason the resource was scheduled according to the following provisions:

(A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve charges shall be allocated to real-time deviations from day-ahead schedules.

(B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve charges shall be allocated according to ratio share of real time load plus export transactions.

(C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated pursuant to (A) or (B) above.

(ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to the following provisions:

(A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, charges will be assessed pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the charges for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(h)(ii)(A) of Schedule 1 of this Agreement to operate in real-time during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to real-time deviations from day-ahead schedules.

(q) The Office of the Interconnection shall determine regional balancing Operating Reserve rates for the Western and Eastern Regions of the PJM Region. For the purposes of this section, the Western Region shall be the AEP, APS, ComEd, Duquesne, Dayton ATSI transmission Zones, and the Eastern Region shall be the AEC, BGE, Dominion, PENELEC, PEPCO, ME, PPL, JCPL, PECO, DPL, PSEG, RE transmission Zones. The regional balancing Operating Reserve rates shall be determined in accordance with the following provisions:

(i) The Office of the Interconnection shall calculate regional adder rates for the Eastern and Western Regions. Regional adder rates shall be equal to the total balancing Operating Reserve credits paid to generators for transmission constraints that occur on transmission system capacity equal to or less than 345kv. The regional adder rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are designated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(ii) The Office of the Interconnection shall calculate RTO balancing Operating Reserve rates. RTO balancing Operating Reserve rates shall be equal to balancing Operating Reserve credits in excess of the regional adder rates calculated pursuant to Section 3.2.3(q)(i) of Schedule 1 of this Agreement. The RTO balancing Operating Reserve rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are allocated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(iii) Reliability and deviation regional balancing Operating Reserve rates shall be determined by summing the relevant RTO balancing Operating Reserve rates and regional adder rates.

(iv) If the Eastern and/or Western Regions do not have regional adder rates, the relevant regional balancing Operating Reserve rate shall be the reliability and/or deviation RTO balancing Operating Reserve rate.

3.2.3A Synchronized Reserve.

(a) Each Internal Market Buyer that is a Load Serving Entity shall have an obligation for hourly Synchronized Reserve equal to its pro rata share of Synchronized Reserve requirements for the hour for each Synchronized Reserve Zone of the PJM Region, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Synchronized Reserve Zone for the hour ("Synchronized Reserve Obligation"), less any amount obtained from condensers associated with provision of Reactive Services as described in section 3.2.3B(i) and any amount obtained from condensers associated with post-contingency operations, as described in section 3.2.3C(b). An Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation shall be charged for the Synchronized Reserve dispatched by the Office of the Interconnection to meet such obligation at the Synchronized Reserve Market Clearing Price determined in accordance with subsection (d) of this section, plus the amounts if any, described in subsections (g), (h) and (i) of this section.

(b) A Generating Market Buyer supplying Synchronized Reserve at the direction of the Office of the Interconnection, in excess of its hourly Synchronized Reserve Obligation, shall be credited as follows:

i) Credits for Synchronized Reserve provided by generation units that are then subject to the energy dispatch signals and instructions of the Office of the Interconnection and that increase their current output or Demand Resources that reduce their load in response to a Synchronized Reserve Event ("Tier 1 Synchronized Reserve") shall be at the Synchronized Energy Premium Price.

ii) Credits for Synchronized Reserve provided by generation resources that are synchronized to the grid but, at the direction of the Office of the Interconnection, are operating at a point that deviates from the Office of the Interconnection energy dispatch signals and instructions ("Tier 2 Synchronized Reserve") shall be the higher of (i) the

Synchronized Reserve Market Clearing Price or (ii) the sum of (A) the Synchronized Reserve offer, and (B) the specific opportunity cost of the generation resource supplying the increment of Synchronized Reserve, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

iii) Credits for Synchronized Reserve provided by Demand Resources that are synchronized to the grid and accept the obligation to reduce load in response to a synchronized Reserve Event initiated by the Office of the Interconnection shall be the sum of (i) the higher of (A) the Synchronized Reserve offer or (B) the Synchronized Reserve Market Clearing Price and (ii) if a Synchronized Reserve Event is actually initiated by the Office of the Interconnection and the Demand Resource reduced its load in response to the event, the fixed costs associated with achieving the load reduction, as specified in the PJM Manuals.

(c) The Synchronized Reserve Energy Premium Price is the average of the five-minute Locational Marginal Prices calculated during the Synchronized Reserve Event plus an adder in an amount to be determined periodically by the Office of the Interconnection not less than fifty dollars and not to exceed one hundred dollars per megawatt hour.

(d) The Synchronized Reserve Market Clearing Price shall be determined for each Synchronized Reserve Zone by the Office of the Interconnection prior to the operating hour and such market-clearing price shall be equal to, from among the generation resources or Demand Resources selected to provide Synchronized Reserve for such Synchronized Reserve Zone, the highest sum of either (i) a generation resource's Synchronized Reserve offer and opportunity cost or (ii) a demand response resource's Synchronized Reserve offer.

(e) In determining the Synchronized Reserve Market Clearing Price, the estimated unit-specific opportunity cost for a generation resource shall be equal to the sum of (i) the product of (A) the expected Locational Marginal Price at the generation bus for the generation resource times (B) the megawatts of energy used to provide Synchronized Reserve submitted as part of the Synchronized Reserve offer and (ii) the product of (A) the deviation of the set point of the generation resource that is expected to be required in order to provide Synchronized Reserve from the generation resource's expected output level if it had been dispatched in economic merit order times (B) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(f) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Tier 2 Synchronized Reserve and that actively follows the Office of the Interconnection's signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Tier 2 Synchronized Reserve and shall be equal to the sum of (i) the product of (A) the megawatts of energy used by the resource to provide Synchronized Reserve as submitted as part of the generation resource's Synchronized Reserve offer times (B)

the Locational Marginal Price at the generation bus of the generation resource, and (ii) the product of (A) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's signals and instructions from the generation resource's expected output level if it had been dispatched in economic merit order, times (B) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the generation resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(g) Charges for Tier 1 Synchronized Reserve will be allocated in proportion to the amount of Tier 1 Synchronized Reserve applied to each Synchronized Reserve Obligation. In the event Tier 1 Synchronized Reserve is provided by a Market Seller in excess of that Market Seller's Synchronized Reserve Obligation, the remainder of the Tier 1 Synchronized Reserve that is not utilized to fulfill the Seller's obligation will be allocated proportionately among all other Synchronized Reserve Obligations.

(h) Any amounts credited for Tier 2 Synchronized Reserve in an hour in excess of the Synchronized Reserve Market Clearing Price in that hour shall be allocated and charged to each Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation in proportion to its purchases of Synchronized Reserve in megawatt-hours during that hour.

(i) In the event the Office of the Interconnection needs to assign more Tier 2 Synchronized Reserve during an hour than was estimated as needed at the time the Synchronized Reserve Market Clearing Price was calculated for that hour due to a reduction in available Tier 1 Synchronized Reserve, the costs of the excess Tier 2 Synchronized Reserve shall be allocated and charged to those providers of Tier 1 Synchronized Reserve whose available Tier 1 Synchronized Reserve was reduced from the needed amount estimated during the Synchronized Reserve Market Clearing Price calculation, in proportion to the amount of the reduction in Tier 1 Synchronized Reserve availability.

(j) In the event a generation resource or Demand Resource that either has been assigned by the Office of the Interconnection or self-scheduled by the owner to provide Tier 2 Synchronized Reserve fails to provide the assigned or self-scheduled amount of Synchronized Reserve in response to an actual Synchronized Reserve Event, the owner of the resource shall incur an additional Synchronized Reserve Obligation in the amount of the shortfall for a period of three consecutive days with the same peak classification (on-peak or off-peak) as the day of the Synchronized Reserve Event at least three business days following the Synchronized Reserve Event. The overall Synchronized Reserve requirement for each Synchronized Reserve Zone of the PJM Region on which the Synchronized Reserve Obligations, except for the additional obligations set forth in this section, are based shall be reduced by the amount of this shortfall for the applicable three-day period.

(k) The magnitude of response to a Synchronized Reserve Event by a generation resource or a Demand Resource, except for Batch Load Demand Resources covered by section 3.2.3A(l) is the difference between the generation resource's output or the Demand Resource's consumption at the start of the event and its output or consumption 10 minutes after the start of

the event. In order to allow for small fluctuations and possible telemetry delays, generation resource output or Demand Resource consumption at the start of the event is defined as the lowest telemetered generator resource output or greatest Demand Resource consumption between one minute prior to and one minute following the start of the event. Similarly, a generation resource's output or a Demand Resource's consumption 10 minutes after the event is defined as the greatest generator resource output or lowest Demand Resource consumption achieved between 9 and 11 minutes after the start of the event. The response actually credited to a generation resource will be reduced by the amount the megawatt output of the generation resource falls below the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter. The response actually credited to a Demand Resource will be reduced by the amount the megawatt consumption of the Demand Resource exceeds the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter.

(l) The magnitude of response by a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the start of a Synchronized Reserve Event shall be the difference between (i) the Batch Load Demand Resource's consumption at the end of the Synchronized Reserve Event and (ii) the Batch Load Demand Resource's consumption during the minute within the ten minutes after the end of the Synchronized Reserve Event in which the Batch Load Demand Resource's consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the magnitude of the response shall be zero if, when the Synchronized Reserve Event commences, the scheduled off-cycle stage of the production cycle is greater than ten minutes.

3.2.3A.01 Day-ahead Scheduling Reserves.

(a) The Office of the Interconnection shall satisfy the Day-ahead Scheduling Reserves Requirement by procuring Day-ahead Scheduling Reserves in the Day-ahead Scheduling Reserves Market from Day-ahead Scheduling Reserves Resources, provided that Demand Resources shall be limited to providing the lesser of any limit established by the Reliability First Corporation or SERC, as applicable, or twenty-five percent of the total Day-ahead Scheduling Reserves Requirement. Day-ahead Scheduling Reserves Resources that clear in the Day-ahead Scheduling Reserves Market shall receive a Day-ahead Scheduling Reserves schedule from the Office of the Interconnection for the relevant Operating Day. PJMSettlement shall be the Counterparty to the purchases and sales of Day-ahead Scheduling Reserves in the PJM Interchange Energy Market; provided that PJMSettlement shall not be a contracting party to bilateral transactions between Market Participants or with respect to a self-schedule or self-supply of generation resources by a Market Buyer to satisfy its Day-ahead Scheduling Reserves Requirement.

(b) A Day-ahead Scheduling Reserves Resource that receives a Day-ahead Scheduling Reserves schedule pursuant to subsection (a) of this section shall be paid the hourly Day-ahead Scheduling Reserves Market clearing price for the MW obligation in each hour of the schedule, subject to meeting the requirements of subsection (c) of this section.

(c) To be eligible for payment pursuant to subsection (b) of this section, Day-ahead Scheduling Reserves Resources shall comply with the following provisions:

(i) Generation resources with a start time greater than thirty minutes are required to be synchronized and operating at the direction of the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule and shall have a dispatchable range equal to or greater than the Day-ahead Scheduling Reserves schedule.

(ii) Generation resources and Demand Resources with start times or shut-down times, respectively, equal to or less than 30 minutes are required to respond to dispatch directives from the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule. To meet this requirement the resource shall be required to start or shut down within the specified notification time plus its start or shut down time, provided that such time shall be less than thirty minutes.

(iii) Demand Resources with a Day-ahead Scheduling Reserves schedule shall be credited based on the difference between the resource's MW consumption at the time the resource is directed by the Office of the Interconnection to reduce its load (starting MW usage) and the resource's MW consumption at the time when the Demand Resource is no longer dispatched by PJM (ending MW usage). For the purposes of this subsection, a resource's starting MW usage shall be the greatest telemetered consumption between one minute prior to and one minute following the issuance of a dispatch instruction from the Office of the Interconnection, and a resource's ending MW usage shall be the lowest consumption between one minute before and one minute after a dispatch instruction from the Office of the Interconnection that is no longer necessary to reduce.

(iv) Notwithstanding subsection (iii) above, the credit for a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the time the resource is directed by the Office of the Interconnection to reduce its load shall be the difference between (i) the "ending MW usage" (as defined above) and (ii) the Batch Load Demand Resource's consumption during the minute within the ten minutes after the time of the "ending MW usage" in which the Batch Load Demand Resource's consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the credit shall be zero if, at the time the resource is directed by the Office of the Interconnection to reduce its load, the scheduled off-cycle stage of the production cycle is greater than the timeframe for which the resource was dispatched by PJM.

Resources that do not comply with the provisions of this subsection (c) shall not be eligible to receive credits pursuant to subsection (b) of this section.

(d) The cost of credits allocated to Day-ahead Scheduling Reserves Resources pursuant to this section shall be charged to Load-Serving Entities in the PJM Region based on load ratio share (net of operating Behind The Meter Generation, but not to be less than zero),

provided that a Load-Serving Entity may satisfy its Day-ahead Scheduling Reserves obligation, which is equal to the Day-ahead Scheduling Reserves Requirement multiplied by the Load-Serving Entity's load ratio share for the PJM Region, through one or any combination of the following: 1) the Day-ahead Scheduling Reserves Market; 2) and bilateral arrangements. The Day-ahead Scheduling Reserve charges allocated pursuant to this section shall reflect any portion of a Load-Serving Entity's Day-ahead Scheduling Reserves obligation that is met by bilateral arrangement(s).

(e) If the Day-ahead Scheduling Reserves Requirement is not satisfied through the operation of subsection (a) of this section, any additional Operating Reserves required to meet the requirement shall be scheduled by the Office of the Interconnection pursuant to Section 3.2.3 of Schedule 1 of this Agreement.

3.2.3B Reactive Services.

(a) A Market Seller providing Reactive Services at the direction of the Office of the Interconnection shall be credited as specified below for the operation of its resource. These provisions are intended to provide payments to generating units when the LMP dispatch algorithms would not result in the dispatch needed for the required reactive service. LMP will be used to compensate generators that are subject to redispatch for reactive transfer limits.

(b) At the end of each Operating Day, where the active energy output of a Market Seller's resource is reduced or suspended at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region, the Market Seller shall be credited according to Sections 3.2.3B(c) & 3.2.3B(d).

(c) A Market Seller providing Reactive Services from either a steam-electric generating unit or combined cycle unit operating in combined cycle mode, where such unit is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override) shall be compensated for lost opportunity cost by receiving a credit hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$

where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended determined according to the real time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(d) A Market Seller providing Reactive Services from either a combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

(i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection as directed by the PJM dispatcher, then the Market Seller shall be credited in a manner consistent with that described above in Section 3.2.3B(c) for a steam unit or a combined cycle unit operating in combined cycle mode.

(ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

$URTLMP$ equals the real time LMP at the unit's bus;

$UDALMP$ equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(e) At the end of each Operating Day, where the active energy output of a Market Seller's unit is increased at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region and the offered price of the energy is above the real-time LMP at the unit's bus, the Market Seller shall be credited according to Section 3.2.3B(f).

(f) A Market Seller providing Reactive Services from either a steam-electric generating unit, combined cycle unit or combustion turbine unit, where such unit is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is lower than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall receive a credit hourly in an amount equal to $\{(AG - LMP_{DMW}) \times (UB - URTLMP)\}$ where:

AG equals the actual hourly integrated output of the unit;

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

UB equals the unit offer for that unit for which output is increased, determined according to the real time scheduled offer curve on which the unit was operating;

URLTMP equals the real time LMP at the unit's bus; and

where $UB - URTLMP$ shall not be negative.

(g) A Market Seller providing Reactive Services from a hydroelectric resource where such resource is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the output of such resource is altered from the schedule submitted by the Market Seller for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(h) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for lost opportunity cost associated with following the Office of the Interconnection's dispatch instructions to reduce or suspend a unit's output for the purpose of maintaining reactive reliability, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of such alternate lost opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of alternate lost opportunity cost compensation, the Office of the Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit disagrees with the modified amount of alternate lost opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(i) The amount of Synchronized Reserve provided by generating units maintaining reactive reliability shall be counted as Synchronized Reserve satisfying the overall PJM

Synchronized Reserve requirements. Operators of these generating units shall be notified of such provision, and to the extent a generating unit's operator indicates that the generating unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated to provide Reactive Services also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generating unit provided synchronous condensing multiplied by the amount of Synchronized reserve provided by the synchronous condenser or (ii) the sum of (A) the generating unit's hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of MW energy usage for providing synchronous condensing multiplied by the real time LMP at the generating unit's bus, (C) the generating unit's startup-cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generating resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated to provide Reactive Services was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generating unit's cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to paragraph (l) below.

(j) A Market Seller's pool scheduled steam-electric generating unit or combined cycle unit operating in combined cycle mode, that is not committed to operate in the Day-ahead Market, but that is directed by the Office of Interconnection to operate solely for the purpose of maintaining reactive reliability, at the request of the Office of the Interconnection, shall be credited in the amount of the unit's offered price for start-up and no-load fees. The unit also shall receive, if applicable, compensation in accordance with Sections 3.2.3B(e)-(f).

(k) The sum of the foregoing credits as specified in Sections 3.2.3B(b)-(j) shall be the cost of Reactive Services for the purpose of maintaining reactive reliability for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched for the purpose of maintaining reactive reliability in such transmission zone.

(l) The cost of Reactive Services for the purpose of maintaining reactive reliability in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

(m) Generating units receiving dispatch instructions from the Office of the Interconnection under the expectation of increased actual or reserve reactive shall inform the Office of the Interconnection dispatcher if the requested reactive capability is not achievable. Should the operator of a unit receiving such instructions realize at any time during which said instruction is effective that the unit is not, or likely would not be able to, provide the requested amount of reactive support, the operator shall as soon as practicable inform the Office of the Interconnection dispatcher of the unit's inability, or expected inability, to provide the required reactive support, so that the associated dispatch instruction may be cancelled. PJM Performance Compliance personnel will audit operations after-the-fact to determine whether a unit that has altered its active power output at the request of the Office of the Interconnection has provided the actual reactive support or the reactive reserve capability requested by the Office of the Interconnection. PJM shall utilize data including, but not limited to, historical reactive performance and stated reactive capability curves in order to make this determination, and may withhold such compensation as described above if reactive support as requested by the Office of the Interconnection was not or could not have been provided.

3.2.3C Synchronous Condensing for Post-Contingency Operation.

(a) Under normal circumstances, PJM operates generation out of merit order to control contingency overloads when the flow on the monitored element for loss of the contingent element ("contingency flow") exceeds the long-term emergency rating for that facility, typically a 4-hour or 2-hour rating. At times however, and under certain, specific system conditions, PJM does not operate generation out of merit order for certain contingency overloads until the contingency flow on the monitored element exceeds the 30-minute rating for that facility ("post-contingency operation"). In conjunction with such operation, when the contingency flow on such element exceeds the long-term emergency rating, PJM operates synchronous condensers in the areas affected by such constraints, to the extent they are available, to provide greater certainty that such resources will be capable of producing energy in sufficient time to reduce the flow on the monitored element below the normal rating should such contingency occur.

(b) The amount of Synchronized Reserve provided by synchronous condensers associated with post-contingency operation shall be counted as Synchronized Reserve satisfying the PJM Synchronized Reserve requirements. Operators of these generation units shall be notified of such provision, and to the extent a generation unit's operator indicates that the generation unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated in conjunction with post-contingency operation also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing in conjunction with post-contingency operation at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generation resource provided synchronous condensing multiplied by the amount of Synchronized Reserve provided by the synchronous condenser or (ii) the sum of (A) the generation resource's hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of the megawatts of energy used to provide synchronous condensing multiplied by the real-time LMP at the generation bus of the generation resource, (C) the generation resource's start-up cost

of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generation resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated in association with post-contingency constraint control was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generation unit's cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to section (d) below.

(c) The sum of the foregoing credits as specified in section 3.2.3C(b) shall be the cost of synchronous condensers associated with post-contingency operations for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched in association with post-contingency operation in such transmission zone.

(d) The cost of synchronous condensers associated with post-contingency operations in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

3.2.4 Transmission Congestion Charges.

Each Market Buyer shall be assessed Transmission Congestion Charges as specified in Section 5 of this Schedule.

3.2.5 Transmission Loss Charges.

Each Market Buyer shall be assessed Transmission Loss Charges as specified in Section 5 of this Schedule.

3.2.6 Emergency Energy.

(a) Market Participants shall be allocated a proportionate share of the net cost of Emergency energy purchased by the Office of the Interconnection. Such allocated share during each hour of such Emergency energy purchase shall be in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales. This deviation shall not include any reduction or suspension of output of pool scheduled resources requested by PJM to manage an Emergency within the PJM Region.

(b) Net revenues in excess of Real-time Prices attributable to sales of energy in connection with Emergencies to other Control Areas shall be credited to Market Participants during each hour of such Emergency energy sale in proportion to the sum of (i) each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales, and (ii) each Market Participant's energy sales from within the PJM Region to entities outside the PJM Region that have been curtailed by PJM.

(c) The net costs or net revenues associated with sales or purchases of hourly energy in connection with a Minimum Generation Emergency in the PJM Region, or in another Control Area, shall be allocated during each hour of such Emergency sale or purchase to each Market Participant in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Market, whenever that deviation increases the Market Participant's spot market sales or decreases its spot market purchases.

3.2.7 Billing.

(a) PJMSettlement shall prepare a billing statement each billing cycle for each Market Buyer in accordance with the charges and credits specified in Sections 3.2.1 through 3.2.6 of this Schedule, and showing the net amount to be paid or received by the Market Buyer. Billing statements shall provide sufficient detail, as specified in the PJM Manuals, to allow verification of the billing amounts and completion of the Market Buyer's internal accounting.

(b) If deliveries to a Market Buyer that has PJM Interchange meters in accordance with Section 14 of the Operating Agreement include amounts delivered for a Market Participant that does not have PJM Interchange meters separate from those of the metered Market Buyer, PJMSettlement shall prepare a separate billing statement for the unmetered Market Participant based on the allocation of deliveries agreed upon between the Market Buyer and the unmetered Market Participant specified by them to the Office of the Interconnection.

3.3A Economic Load Response Participants.

3.3A.1 Compensation.

Economic Load Response Participants shall be compensated pursuant to Sections 3.3A.5 and/or 3.3A.6 of this Schedule, for demand reduction offers submitted in the Day-Ahead Energy Market or Real-time Energy Market that satisfy the Net Benefits Test of section 3.3A.4; that are scheduled by the Office of the Interconnection; and that follow the dispatch instructions of the Office of the Interconnection. Qualifying demand reductions shall be measured by: 1) comparing actual metered load to an end-use customer's Customer Baseline Load or alternative CBL determined in accordance with the provisions of Section 3.3A.2 or 3.3A.2.01, respectively; or 2) by the MWs produced by on-Site Generators pursuant to the provisions of Section 3.3A.2.02.

3.3A.2 Customer Baseline Load.

For Economic Load Response Participants that choose to measure demand reductions using an end-use customer's Customer Baseline Load ("CBL"), the CBL shall be determined using the following formula for such participant's Non-Variable Loads:

- (a) The CBL for weekdays shall be the average of the highest 4 out of the 5 most recent load weekdays in the 45 calendar day period preceding the relevant load reduction event.
 - i. For the purposes of calculating the CBL for weekdays, weekdays shall not include:
 - 1. NERC holidays;
 - 2. Weekend days;
 - 3. Event days. For the purposes of this section an event day shall be any weekday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.4 or 3.3A.5, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
 - 4. Any weekday where the average daily event period usage is less than 25% of the average event period usage for the five days.
 - ii. If a 45-day period does not include 5 weekdays that meet the conditions in subsection (a)(i) of this section, provided there are 4 weekdays that meet the conditions in subsection (a)(i) of this section, the CBL shall be based on the average of those 4 weekdays. If there are not 4 eligible weekdays, the CBL shall be determined in accordance with subsection (iii) of this section.

iii. Section 3.3A.2(a)(i)(3) notwithstanding, if a 45-day period does not include 4 weekdays that meet the conditions in subsection (a)(i) of this section, event days will be used as necessary to meet the 4 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(b) The CBL for weekend days and NERC holidays shall be determined in accordance with the following provisions:

i. The CBL for Saturdays and Sundays/NERC holidays shall be the average of the highest 2 load days out of the 3 most recent Saturdays or Sundays/NERC holidays, respectively, in the 45 calendar day period preceding the relevant load reduction event, provided that the following days shall not be used to calculate a Saturday or Sunday/NERC holiday CBL:

1. Event days. For the purposes of this section an event day shall be any Saturday and Sunday/NERC holiday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.5 or 3.3A.6, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
2. Any Saturday or Sunday/NERC holiday where the average daily event period usage is less than 25% of the average event period usage level for the three days;
3. Any Saturday or Sunday/NERC holiday that corresponds to the beginning or end of daylight savings.

ii. If a 45-day period does not include 3 Saturdays or 3 Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, provided there are 2 Saturdays or Sundays/NERC holidays that meet the conditions in subsection (b)(i) of this section, the CBL will be based on the average of those 2 Saturdays or Sundays/NERC holidays. If there are not 2 eligible Saturdays or Sundays/NERC holidays, the CBL shall be determined in accordance with subsection (iii) of this section.

iii. Section 3.3A.2(b)(i)(1) notwithstanding, if a 45-day period does not include 2 Saturdays or Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, event days will be used as necessary to meet the 2 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(c) CBLs established pursuant to this section shall represent end-use customers' actual load patterns. If the Office of the Interconnection determines that a CBL or alternative CBL does not accurately represent a customer's actual load patterns, the CBL shall be revised accordingly pursuant to Section 3.3A.2.01. Consistent with this requirement, if an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a

change in its operations or the operations of the end-use customer upon whose behalf it is acting that would result in the adjustment of more than half the hours in the affected party's Customer Baseline Load by twenty percent or more for more than twenty days.

3.3A.2.01 Alternative Customer Baseline Methodologies.

(a) During the Economic Load Response Participant registration process pursuant to Section 1.5A.3 of this Schedule, the relevant Economic Load Response Participant or the Office of the Interconnection ("Interested Parties") may, in the case of such participant's Non-Variable Load customers, and shall, in the case of its Variable Load customers, propose an alternative CBL calculation that more accurately reflects the relevant end-use customer's consumption pattern relative to the CBL determined pursuant to Section 3.3A.2. In support of such proposal, the participant shall demonstrate that the alternative CBL method shall result in an hourly relative root mean square error of twenty percent or less compared to actual hourly values, as calculated in accordance with the technique specified in the PJM Manuals. Any proposal made pursuant to this section shall be provided to the other Interested Party.

(b) The Interested Parties shall have 30 days to agree on a proposal issued pursuant to subsection (a) of this section. The 30-day period shall start the day the proposal is provided to the other Interested Party. If both Interested Parties agree on a proposal issued pursuant to this section, that alternative CBL calculation methodology shall be effective consistent with the date of the relevant Economic Load Response Participant registration.

(c) If agreement is not reached pursuant to subsection (b) of this section, the Office of the Interconnection shall determine a CBL methodology within 20 days from the expiration of the 30-day period established by subsection (b). A CBL established by the Office of the Interconnection pursuant to this subsection (c) shall be binding upon both Interested Parties unless the Interested Parties reach agreement on an alternative CBL methodology prior to the expiration of the 20-day period established by this subsection (c).

(d) Operation of this Section 3.3A.2.01 shall not delay Economic Load Response Participant registrations pursuant to Section 1.5A.3, provided that the alternative CBL established pursuant to this section shall be used for all related energy settlements made pursuant to Sections 3.3A.4 and 3.3A.5.

(e) The Office of the Interconnection shall periodically publish alternative CBL methodologies established pursuant to this section in the PJM Manuals.

3.3A.2.02 On-Site Generators.

On-Site Generators used as the basis for Economic Load Response Participant status pursuant to Section 1.5A shall be subject to the following provisions:

i. The On-Site Generator shall be used solely to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the

Real-time Energy Market and/or the Day-ahead Energy Market and shall not otherwise have been operating;

ii. If subsection (i) does not apply, the amount of energy from an On-Site Generator used to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market shall be capable of being quantified in a manner that is acceptable to the Office of the Interconnection.

3.3A.3 Symmetric Additive Adjustment.

(a) Customer Baseline Levels established pursuant to section 3.3A.2 shall be adjusted by the Symmetric Additive Adjustment. Unless an alternative formula is approved by the Office of the Interconnection, the Symmetric Additive Adjustment shall be calculated using the following formula:

Step 1: Calculate the average usage over the 3 hour period ending 1 hour prior to the start of event.

Step 2: Calculate the average usage over the 3 hour period in the CBL that corresponds to the 3 hour period described in Step 1.

Step 3: Subtract the results of Step 2 from the results of Step 1 to determine the symmetric additive adjustment (this may be positive or negative).

Step 4: Add the symmetric additive adjustment (i.e. the results of Step 3) to each hour in the CBL that corresponds to each event hour.

(b) Following a Load Reduction Event that is submitted to the Office of the Interconnection for compensation, the Office of the Interconnection shall provide the Notification window(s), if applicable, directly metered data and Customer Baseline Load and Symmetric Additive Adjustment calculation to the appropriate electric distribution company for optional review. The electric distribution company will have ten business days to provide the Office of the Interconnection with notification of any issues related to the metered data or calculations.

3.3A.4 Net Benefits Test.

The Office of the Interconnection shall identify each month the price on a supply curve, representative of conditions expected for that month, at which the benefit of load reductions provided by Economic Load Response Participants exceed the costs of those reductions to other loads. In formulaic terms, the net benefit is deemed to be realized at the price point on the supply curve where $(\Delta \text{LMP} \times \text{MWh consumed}) > (\text{LMP}_{\text{NEW}} \times \text{DR})$, where LMP_{NEW} is the market clearing price after Economic Load Response is dispatched and ΔLMP is the price before Economic Load Response is dispatched minus the LMP_{NEW} .

The Office of the Interconnection shall update and post the Net Benefits Test results and analysis for a calendar month no later than the 15th day of the preceding calendar month. As more fully specified in the PJM Manuals, the Office of the Interconnection shall calculate the net benefit price level in accordance with the following steps:

Step 1. Retrieve generation offers from the same calendar month (of the prior calendar year) for which the calculation is being performed, employing market-based price offers to the extent available, and cost-based offers to the extent market-based price offers are not available. To the extent that generation offers are unavailable from historical data due to the addition of a Zone to the PJM Region the Office of the Interconnection shall use the most recent generation offers that best correspond to the characteristics of the calendar month for which the calculation is being performed, provided that at least 30 days of such data is available. If less than 30 days of data is available for a resource or group of resources, such resource[s] shall not be considered in the Net Benefits Test calculation.

Step 2: Adjust a portion of each prior-year offer representing the typical share of fuel costs in energy offers in the PJM Region, as specified in the PJM Manuals, for changes in fuel prices based on the ratio of the reference month spot price to the study month forward price. For such purpose, natural gas shall be priced at the Henry Hub price, number 2 fuel oil shall be priced at the New York Harbor price, and coal shall be priced as a blend of coal prices representative of the types of coal typically utilized in the PJM Region.

Step 3. Combine the offers to create daily supply curves for each day in the period.

Step 4. Average the daily curves for each day in the month to form an average supply curve for the study month.

Step 5. Use a non-linear least squares estimation technique to determine an equation that reasonably approximates and smooths the average supply curve.

Step 6. Determine the net benefit level as the point at which the price elasticity of supply is equal to 1 for the estimated supply curve equation established in Step 5.

3.3A.5 Market Settlements in Real-time Energy Market.

(a) Economic Load Response Participants that submit offers for load reductions in the Real time Energy Market no later than 6:00 p.m. on the day prior to the operating day that satisfy the Net Benefits Test and that are dispatched by the Office of the Interconnection in the Real-time Energy Market shall be compensated for reducing demand based on the actual kWh relief provided in excess of committed day-ahead load reductions. The offer shall contain the Offer Data specified in section 1.10.1A(k) and shall not thereafter be subject to change; provided, however, the Economic Load Response Participant may revise the previously specified minimum or maximum load reduction quantity for an operating hour by providing notice to the Office of the Interconnection in the form and manner specified in the PJM Manuals no later than three hours prior to such operating hour. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a

single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements. The Economic Load Response Participant that curtails or causes the curtailment of demand in real-time will be compensated by PJM Settlement at the real-time Locational Marginal Price.

(b) In cases where the demand reduction follows dispatch, as defined in section 3.2.3(o-1), as instructed by the Office of the Interconnection, payment will not be less than the total value of the demand reduction bid. For the purposes of this section, the total value of a demand reduction bid shall include any submitted start-up costs associated with reducing demand, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the demand reduction must be committed.

Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, real-time operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) For purposes of load reductions qualifying for compensation hereunder, an Economic Load Response Participant shall accumulate credits for energy reductions in those hours when the energy delivered to the end-use customer is less than the end-use customer's Customer Baseline Load at the corresponding hourly rate. In the event that the end-use customer's hourly energy consumption is greater than the Customer Baseline Load, the Economic Load Response Participant will accumulate debits at the corresponding hourly rate for the amount the end-use customer's hourly energy consumption is greater than the Customer Baseline Load. If the actual load reduction, compared to the desired load reduction is outside the deviation levels specified in section 3.2.3(o) of this Appendix, the Economic Load Response Participant shall be assessed balancing operating reserve charges in accordance with that section 3.2.3.

(d) The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, with the ratio shares determined as follows:

The ratio share for LSE i in zone z shall be $RTL_{iz}/(RTL + X)$ and the ratio share for party j shall be $X_j/(RTL + X)$.

Where:

RTL is the total real time load in all zones where LMP > Net Benefits Test price;
RTL_{iz} is the real-time load for LSE *i* in zone *z*;
X is the total export quantity from PJM in that hour; and
X_j is the export quantity by party *j* from PJM.

3.3A.6 Market Settlements in the Day-ahead Energy Market.

(a) Economic Load Response Participants dispatched as a result of a qualifying demand reduction offer in the Day-ahead Energy Market shall be compensated for reducing demand based on the reductions of kWh committed in the Day-ahead Energy Market. An Economic Load Response Participant that submits a demand reduction bid day ahead that satisfies the Net Benefits Test and is accepted by the Office of the Interconnection shall be paid the day-ahead Locational Marginal Price. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements.

(b) Total payments to Economic Load Response Participants for accepted day-ahead demand reduction bids that follow the dispatch instructions of the Office of the Interconnection will not be less than the total value of the demand reduction bid. For the purposes of this section, the total value of a demand reduction bid shall include any submitted start-up costs associated with reducing load, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the load reduction must be committed. Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, day-ahead operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) Economic Load Response Participants that have demand reductions committed in the Day-ahead Energy Market that deviate from the day-ahead schedule in real time shall be charged or credited for such variance at the real time LMP plus or minus an amount equal to the applicable balancing operating reserve charge in accordance with section 3.2.3 of this Appendix. Load Serving Entities that otherwise would have load that was reduced shall receive any associated operating reserve credit.

(d) The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average real-time Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, in accordance with the formula prescribed in section 3.3A.5(d).

3.3A.7 Prohibited Economic Load Response Participant Market Settlements.

(a) Settlements pursuant to Sections 3.3A.5 and 3.3A.6 shall be limited to demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market that satisfy the Net Benefits Test and are dispatched by the Office of the Interconnection.

(b) Demand reductions that do not meet the requirements of Section 3.3A.7(a) shall not be eligible for settlement pursuant to Sections 3.3A.5 and 3.3A.6. Examples of settlements prohibited pursuant to this Section 3.3A.7(b) include, but are not limited to, the following:

i. Settlements based on variable demand where the timing of the demand reduction supporting the settlement did not change in direct response to Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market;

ii. Consecutive daily settlements that are the result of a change in normal demand patterns that are submitted to maintain a CBL that no longer reflects the relevant end-use customer's demand;

iii. Settlements based on On-Site Generator data if the On Site Generation is not supporting demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market;

iv. Settlements based on demand reductions that are the result of operational changes between multiple end-use customer sites in the PJM footprint;

v. Settlements that do not include all hours that the Office of the Interconnection dispatched the load reduction, or for which the load reduction cleared in the Day-ahead Market.

(c) The Office of the Interconnection shall disallow settlements for demand reductions that do not meet the requirements of Section 3.3A.7(a). If the Economic Load Response Participant continues to submit settlements for demand reductions that do not meet the requirements of Section 3.3A.7(a), then the Office of the Interconnection shall suspend the Economic Load Response Participant's PJM Interchange Energy Market activity and refer the matter to the FERC Office of Enforcement.

3.3A.8 Economic Load Response Participant Review Process.

(a) The Office of the Interconnection shall review the participation of an Economic Load Response Participant in the PJM Interchange Energy Market under the following circumstances:

i. An Economic Load Response Participant's registrations submitted pursuant to Section 1.5A.3 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).

ii. An Economic Load Response Participant's settlements pursuant to Sections 3.3A.5 and 3.3A.6 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).

iii. An Economic Load Response Participant's settlements pursuant to Sections 3.3A.5 and 3.3A.6 are denied by the Office of the Interconnection more than 10% of the time.

iv. An Economic Load Response Participant's registration will be reviewed when settlements are frequently submitted or if its actual loads frequently deviate from the previously scheduled quantities (as determined for purposes of assessing balancing operating reserves charges). PJM will notify the Participant when their registration is under review. While the Participant's registration is under review by PJM, the Participant may continue economic load reductions but all settlements will be denied by PJM until the registration review is resolved pursuant to subsection (i) or (ii) below. PJM will require the Participant to provide information within 30 days to support that the settlements were submitted for load reduction activity done in response to price and not submitted based on the End-Use Customer's normal operations.

i) If the Participant is unable to provide adequate supporting information to substantiate the load reductions submitted for settlement, PJM will terminate the registration and may refer the Participant to either the Market Monitoring Unit or the Federal Energy Regulatory Commission for further investigation.

ii) If the Participant does provide adequate supporting information, the settlements denied by PJM will be resubmitted by the Participant for review according to existing PJM market rules. Further, PJM may introduce an alternative Customer Baseline Load if the existing Customer Baseline Load does not adequately reflect what the customer load would have been absent a load reduction.

v. The electric distribution company may only deny settlements during the normal settlement review process for inaccurate data including, but not limited to: meter data, line loss factor, Customer Baseline Load calculation, interval meter owner and a known recurring End-Use Customer outage or holiday.

(b) The Office of the Interconnection shall have thirty days to conduct a review pursuant to this Section 3.3A.8. The Office of the Interconnection may refer the matter to the PJM MMU and/or the FERC Office of Enforcement if the review indicates the relevant Economic Load Response Participant and/or relevant electric distribution company or LSE is engaging in activity that is inconsistent with the PJM Interchange Energy Market rules governing Economic Load Response Participants.

ATTACHMENT E

Revisions to Attachment K of the PJM Tariff (redlined)

1.3 Definitions.

1.3.1 Acceleration Request.

“Acceleration Request” shall mean a request pursuant to section 1.9.4A of this Schedule to accelerate or reschedule a transmission outage scheduled pursuant to sections 1.9.2 or 1.9.4.

1.3.1A Auction Revenue Rights.

“Auction Revenue Rights” or “ARRs” shall mean the right to receive the revenue from the Financial Transmission Right auction, as further described in Section 7.4 of this Schedule.

1.3.1B Auction Revenue Rights Credits.

“Auction Revenue Rights Credits” shall mean the allocated share of total FTR auction revenues or costs credited to each holder of Auction Revenue Rights, calculated and allocated as specified in Section 7.4.3 of this Schedule.

1.3.1B.01 Batch Load Demand Resource.

“Batch Load Demand Resource” shall mean a Demand Resource that has a cyclical production process such that at most times during the process it is consuming energy, but at consistent regular intervals, ordinarily for periods of less than ten minutes, it reduces its consumption of energy for its production processes to minimal or zero megawatts.

1.3.1B.02 Congestion Price.

“Congestion Price” shall mean the congestion component of the Locational Marginal Price, which is the effect on transmission congestion costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource, based on the effect of increased generation from or consumption by the resource on transmission line loadings, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.1B.03 Curtailment Service Provider.

“Curtailed Service Provider” or “CSP” shall mean a Member or a Special Member, which action on behalf of itself or one or more other Members or non-Members, participates in the PJM Interchange Energy Market by causing a reduction in demand.

1.3.1B.04 Day-ahead Congestion Price.

“Day-ahead Congestion Price” shall mean the Congestion Price resulting from the Day-ahead Energy Market.

1.3.1C Day-ahead Energy Market.

“Day-ahead Energy Market” shall mean the schedule of commitments for the purchase or sale of energy and payment of Transmission Congestion Charges developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1C.01 Day-ahead Loss Price.

“Day-ahead Loss Price” shall mean the Loss Price resulting from the Day-ahead Energy Market.

1.3.1D Day-ahead Prices.

“Day-ahead Prices” shall mean the Locational Marginal Prices resulting from the Day-ahead Energy Market.

1.3.1D.01 Day-ahead Scheduling Reserves.

“Day-ahead Scheduling Reserves” shall mean thirty-minute reserves as defined by the Reliability First Corporation and SERC.

1.3.1D.02 Day-ahead Scheduling Reserves Requirement.

“Day-ahead Scheduling Reserves Requirement” shall mean the thirty-minute reserve requirement for the PJM Region established consistent with Reliability First Corporation and SERC reliability standards, or those of any additional and/or successor regional reliability organization(s) that are responsible for establishing reliability requirements for the PJM Region, plus any additional thirty-minute reserves scheduled in response to an RTO-wide Hot or Cold Weather Alert or other reasons for conservative operations.

1.3.1D.03 Day-ahead Scheduling Reserves Resources.

“Day-ahead Scheduling Reserves Resources” shall mean synchronized and non-synchronized generation resources and Demand Resources electrically located within the PJM Region that are capable of providing Day-ahead Scheduling Reserves.

1.3.1D.04 Day-ahead Scheduling Reserves Market.

“Day-ahead Scheduling Reserves Market” shall mean the schedule of commitments for the purchase or sale of Day-ahead Scheduling Reserves developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1D.05 Day-ahead System Energy Price.

“Day-ahead System Energy Price” shall mean the System Energy Price resulting from the Day-ahead Energy Market.

1.3.1E Decrement Bid.

“Decrement Bid” shall mean a bid to purchase energy at a specified location in the Day-ahead Energy Market. An accepted Decrement Bid results in scheduled load at the specified location in the Day-ahead Energy Market.

1.3.1E.01 Demand Resource.

“Demand Resource” shall mean a resource with the capability to provide a reduction in demand.

1.3.1F Dispatch Rate.

“Dispatch Rate” shall mean the control signal, expressed in dollars per megawatt-hour, calculated and transmitted continuously and dynamically to direct the output level of all generation resources dispatched by the Office of the Interconnection in accordance with the Offer Data.

1.3.1G Energy Storage Resource.

“Energy Storage Resource” shall mean flywheel or battery storage facility solely used for short term storage and injection of energy at a later time to participate in the PJM energy and/or Ancillary Services markets as a Market Seller.

1.3.2 Equivalent Load.

“Equivalent Load” shall mean the sum of a Market Participant’s net system requirements to serve its customer load in the PJM Region, if any, plus its net bilateral transactions.

1.3.2A Economic Load Response Participant.

“Economic Load Response Participant” shall mean a Member or Special Member that qualifies under Section 1.5A of this Schedule to participate in the PJM Interchange Energy Market through reductions in demand.

1.3.2A.01 Economic Minimum.

“Economic Minimum” shall mean the lowest incremental MW output level a unit can achieve while following economic dispatch.

1.3.2B Energy Market Opportunity Cost.

“Energy Market Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of available run hours due to limitations imposed on the unit by Applicable Laws and Regulations (as defined in PJM Tariff), and (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Energy Market Opportunity Cost therefore is

the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same compliance period, which compliance period is determined by the applicable regulatory authority and is reflected in the rules set forth in PJM Manual 15. Energy Market Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Energy Market Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.3 External Market Buyer.

"External Market Buyer" shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for consumption by end-users outside the PJM Region, or for load in the PJM Region that is not served by Network Transmission Service.

1.3.4 External Resource.

"External Resource" shall mean a generation resource located outside the metered boundaries of the PJM Region.

1.3.5 Financial Transmission Right.

"Financial Transmission Right" or "FTR" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2 of this Schedule.

1.3.5A Financial Transmission Right Obligation.

"Financial Transmission Right Obligation" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(b) of this Schedule.

1.3.5B Financial Transmission Right Option.

"Financial Transmission Right Option" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(c) of this Schedule.

1.3.6 Generating Market Buyer.

"Generating Market Buyer" shall mean an Internal Market Buyer that is a Load Serving Entity that owns or has contractual rights to the output of generation resources capable of serving the Market Buyer's load in the PJM Region, or of selling energy or related services in the PJM Interchange Energy Market or elsewhere.

1.3.7 Generator Forced Outage.

“Generator Forced Outage” shall mean an immediate reduction in output or capacity or removal from service, in whole or in part, of a generating unit by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the facility, as specified in the relevant portions of the PJM Manuals. A reduction in output or removal from service of a generating unit in response to changes in market conditions shall not constitute a Generator Forced Outage.

1.3.8 Generator Maintenance Outage.

“Generator Maintenance Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit in order to perform necessary repairs on specific components of the facility, if removal of the facility meets the guidelines specified in the PJM Manuals.

1.3.9 Generator Planned Outage.

“Generator Planned Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit for inspection, maintenance or repair with the approval of the Office of the Interconnection in accordance with the PJM Manuals.

1.3.9A Increment Bid.

“Increment Bid” shall mean an offer to sell energy at a specified location in the Day-ahead Energy Market. An accepted Increment Bid results in scheduled generation at the specified location in the Day-ahead Energy Market.

1.3.9B Interface Pricing Point.

“Interface Pricing Point” shall have the meaning specified in section 2.6A.

1.3.10 Internal Market Buyer.

“Internal Market Buyer” shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for ultimate consumption by end-users inside the PJM Region that are served by Network Transmission Service.

1.3.11 Inadvertent Interchange.

“Inadvertent Interchange” shall mean the difference between net actual energy flow and net scheduled energy flow into or out of the individual Control Areas operated by PJM.

1.3.11.01 Load Management.

“Load Management” shall mean either a Demand Resource (“DR”) or an Interruptible Load for Reliability (“ILR”) resource, both as defined in the Reliability Assurance Agreement.

1.3.11A Load Reduction Event.

“Load Reduction Event” shall mean a reduction in demand by a Member or Special Member for the purpose of participating in the PJM Interchange Energy Market.

1.3.11B Loss Price.

“Loss Price” shall mean the loss component of the Locational Marginal Price, which is the effect on transmission loss costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource based on the effect of increased generation from or consumption by the resource on transmission losses, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.12 Market Operations Center.

“Market Operations Center” shall mean the equipment, facilities and personnel used by or on behalf of a Market Participant to communicate and coordinate with the Office of the Interconnection in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.12A Maximum Emergency.

“Maximum Emergency” shall mean the designation of all or part of the output of a generating unit for which the designated output levels may require extraordinary procedures and therefore are available to the Office of the Interconnection only when the Office of the Interconnection declares a Maximum Generation Emergency and requests generation designated as Maximum Emergency to run. The Office of the Interconnection shall post on the PJM website the aggregate amount of megawatts that are classified as Maximum Emergency.

1.3.13 Maximum Generation Emergency.

“Maximum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection to address either a generation or transmission emergency in which the Office of the Interconnection anticipates requesting one or more Generation Capacity Resources, or Non-Retail Behind The Meter Generation resources to operate at its maximum net or gross electrical power output, subject to the equipment stress limits for such Generation Capacity Resource or Non-Retail Behind The Meter resource in order to manage, alleviate, or end the Emergency.

1.3.14 Minimum Generation Emergency.

“Minimum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection in which the Office of the Interconnection anticipates requesting one or more generating resources to operate at or below Normal Minimum Generation, in order to manage, alleviate, or end the Emergency.

1.3.14A NERC Interchange Distribution Calculator.

“NERC Interchange Distribution Calculator” shall mean the NERC mechanism that is in effect and being used to calculate the distribution of energy, over specific transmission interfaces, from energy transactions.

1.3.14B Net Benefits Test.

“Net Benefits Test” shall mean a calculation to determine whether the benefits of a reduction in price resulting from the dispatch of Economic Load Response exceeds the cost to other loads resulting from the billing unit effects of the load reduction, as specified in Section 3.3A.4 of this Schedule.

1.3.15 Network Resource.

“Network Resource” shall have the meaning specified in the PJM Tariff.

1.3.16 Network Service User.

“Network Service User” shall mean an entity using Network Transmission Service.

1.3.17 Network Transmission Service.

“Network Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part III of the PJM Tariff, or transmission service comparable to such service that is provided to a Load Serving Entity that is also a Transmission Owner.

1.3.17A Non-Regulatory Opportunity Cost.

“Non-Regulatory Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) a fuel supply limitation, for up to one year, resulting from an event of force majeure; and, (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Non-Regulatory Opportunity Cost therefore is the value associated with a specific generating unit’s lost opportunity to produce energy during a higher valued period of time occurring within the same period of time in which the unit is bound by the referenced restrictions, and is reflected in the rules set forth in PJM Manual 15. Non-Regulatory Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Non-Regulatory Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.17B Non-Variable Loads.

“Non-Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.18 Normal Maximum Generation.

“Normal Maximum Generation” shall mean the highest output level of a generating resource under normal operating conditions.

1.3.19 Normal Minimum Generation.

“Normal Minimum Generation” shall mean the lowest output level of a generating resource under normal operating conditions.

1.3.20 Offer Data.

“Offer Data” shall mean the scheduling, operations planning, dispatch, new resource, and other data and information necessary to schedule and dispatch generation resources and Demand Resource(s) for the provision of energy and other services and the maintenance of the reliability and security of the transmission system in the PJM Region, and specified for submission to the PJM Interchange Energy Market for such purposes by the Office of the Interconnection.

1.3.21 Office of the Interconnection Control Center.

“Office of the Interconnection Control Center” shall mean the equipment, facilities and personnel used by the Office of the Interconnection to coordinate and direct the operation of the PJM Region and to administer the PJM Interchange Energy Market, including facilities and equipment used to communicate and coordinate with the Market Participants in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.21A On-Site Generators.

“On-Site Generators” shall mean generation facilities (including Behind The Meter Generation) that (i) are not Capacity Resources, (ii) are not injecting into the grid, (iii) are either synchronized or non-synchronized to the Transmission System, and (iv) can be used to reduce demand for the purpose of participating in the PJM Interchange Energy Market.

1.3.22 Operating Day.

“Operating Day” shall mean the daily 24 hour period beginning at midnight for which transactions on the PJM Interchange Energy Market are scheduled.

1.3.23 Operating Margin.

“Operating Margin” shall mean the incremental adjustments, measured in megawatts, required in PJM Region operations in order to accommodate, on a first contingency basis, an operating contingency in the PJM Region resulting from operations in an interconnected Control Area. Such adjustments may result in constraints causing Transmission Congestion Charges, or may result in Ancillary Services charges pursuant to the PJM Tariff.

1.3.24 Operating Margin Customer.

“Operating Margin Customer” shall mean a Control Area purchasing Operating Margin pursuant to an agreement between such other Control Area and the LLC.

1.3.25 PJM Interchange.

“PJM Interchange” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds, or is exceeded by, the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller; or (e) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (f) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.26 PJM Interchange Export.

“PJM Interchange Export” shall mean the following, as determined in accordance with Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load is exceeded by the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup sales; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller.

1.3.27 PJM Interchange Import.

“PJM Interchange Import” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup purchases; or (c) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (d) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.28 PJM Open Access Same-time Information System.

“PJM Open Access Same-time Information System” shall mean the electronic communication system for the collection and dissemination of information about transmission services in the PJM Region, established and operated by the Office of the Interconnection in accordance with FERC standards and requirements.

1.3.28A Planning Period Quarter.

“Planning Period Quarter” shall mean any of the following three month periods in the Planning Period: June, July and August; September, October and November; December, January and February; or, March, April and May.

1.3.28B Planning Period Balance.

“Planning Period Balance” shall mean the entire period of time remaining in the Planning Period following the month that a monthly auction is conducted.

1.3.29 Point-to-Point Transmission Service.

“Point-to-Point Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part II of the PJM Tariff.

1.3.30 Ramping Capability.

“Ramping Capability” shall mean the sustained rate of change of generator output, in megawatts per minute.

1.3.30.01 Real-time Congestion Price.

“Real-time Congestion Price” shall mean the Congestion Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30.02 Real-time Loss Price.

“Real-time Loss Price” shall mean the Loss Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30A Real-time Prices.

“Real-time Prices” shall mean the Locational Marginal Prices resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30B Real-time Energy Market.

“Real-time Energy Market” shall mean the purchase or sale of energy and payment of Transmission Congestion Charges for quantity deviations from the Day-ahead Energy Market in the Operating Day.

1.3.30B.01 Real-time System Energy Price.

“Real-time System Energy Price” shall mean the System Energy Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.31 Regulation.

“Regulation” shall mean the capability of a specific generation resource or Demand Resource with appropriate telecommunications, control and response capability to increase or decrease its output or adjust load in response to a regulating control signal, in accordance with the specifications in the PJM Manuals.

1.3.31.01 Residual Auction Revenue Rights.

“Residual Auction Revenue Rights” shall mean incremental stage 1 Auction Revenue Rights created within a Planning Period by an increase in transmission system capability or a change in any other relevant factor that was not modeled pursuant to section 7.5 of Schedule 1 of this Agreement in compliance with section 7.4.2 (h) of Schedule 1 of this Agreement, and, if modeled, would have increased the amount of stage 1 Auction Revenue Rights allocated pursuant to section 7.4.2 of Schedule 1 of this Agreement; provided that, the foregoing notwithstanding, Residual Auction Revenue Rights shall exclude: 1) Incremental Auction Revenue Rights allocated pursuant to Part VI of the Tariff; and 2) Auction Revenue Rights allocated to entities that are assigned cost responsibility pursuant to Schedule 6 of this Agreement for transmission upgrades that create such rights.

1.3.31.02 Special Member.

“Special Member” shall mean an entity that satisfies the requirements of Section 1.5A.02 of this Schedule or the special membership provisions established under the Emergency Load Response Program.

1.3.31A [Reserved]

1.3.31B [Reserved]

1.3.32 Spot Market Backup.

“Spot Market Backup” shall mean the purchase of energy from, or the delivery of energy to, the PJM Interchange Energy Market in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason.

1.3.33 Spot Market Energy.

“Spot Market Energy” shall mean energy bought or sold by Market Participants through the PJM Interchange Energy Market at System Energy Prices determined as specified in Section 2 of this Schedule.

1.3.33A State Estimator.

“State Estimator” shall mean the computer model of power flows specified in Section 2.3 of this Schedule.

1.3.33B Station Power.

“Station Power” shall mean energy used for operating the electric equipment on the site of a generation facility located in the PJM Region or for the heating, lighting, air-conditioning and office equipment needs of buildings on the site of such a generation facility that are used in the operation, maintenance, or repair of the facility. Station Power does not include any energy (i) used to power synchronous condensers; (ii) used for pumping at a pumped storage facility; (iii) used for compressors at a compressed air energy storage facility; (iv) used for charging an Energy Storage Resource; or (v) used in association with restoration or black start service.

1.3.33B.01 Synchronized Reserve.

“Synchronized Reserve” shall mean the reserve capability of generation resources that can be converted fully into energy or Demand Resources whose demand can be reduced within ten minutes from the request of the Office of the Interconnection dispatcher, and is provided by equipment that is electrically synchronized to the Transmission System.

1.3.33B.02 Synchronized Reserve Event.

“Synchronized Reserve Event” shall mean a request from the Office of the Interconnection to generation resources and/or Demand Resources able, assigned or self-scheduled, to provide Synchronized Reserve within ten minutes, to increase the energy output or reduce load by the amount of assigned or self-scheduled Synchronized Reserve capability.

1.3.33B.03 System Energy Price.

“System Energy Price” shall mean the energy component of the Locational Marginal Price, which is the price at which the Market Seller has offered to supply an additional increment of energy from a resource, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.33C Target Allocation.

“Target Allocation” shall mean the allocation of Transmission Congestion Credits as set forth in Section 5.2.3 of this Schedule or the allocation of Auction Revenue Rights Credits as set forth in Section 7.4.3 of this Schedule.

1.3.34 Transmission Congestion Charge.

“Transmission Congestion Charge” shall mean a charge attributable to the increased cost of energy delivered at a given load bus when the transmission system serving that load bus is operating under constrained conditions, or as necessary to provide energy for third-party transmission losses in accordance with Section 9.3, which shall be calculated and allocated as specified in Section 5.1 of this Schedule.

1.3.35 Transmission Congestion Credit.

“Transmission Congestion Credit” shall mean the allocated share of total Transmission Congestion Charges credited to each holder of Financial Transmission Rights, calculated and allocated as specified in Section 5.2 of this Schedule.

1.3.36 Transmission Customer.

“Transmission Customer” shall mean an entity using Point-to-Point Transmission Service.

1.3.37 Transmission Forced Outage.

“Transmission Forced Outage” shall mean an immediate removal from service of a transmission facility by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the transmission facility, as specified in the relevant portions of the PJM Manuals. A removal from service of a transmission facility at the request of the Office of the Interconnection to improve transmission capability shall not constitute a Forced Transmission Outage.

1.3.37A Transmission Loading Relief.

“Transmission Loading Relief” shall mean NERC’s procedures for preventing operating security limit violations, as implemented by PJM as the security coordinator responsible for maintaining transmission security for the PJM Region.

1.3.37B Transmission Loading Relief Customer.

“Transmission Loading Relief Customer” shall mean an entity that, in accordance with Section 1.10.6A, has elected to pay Transmission Congestion Charges during Transmission Loading Relief in order to continue energy schedules over contract paths outside the PJM Region that are increasing the cost of energy in the PJM Region.

1.3.37C Transmission Loss Charge.

“Transmission Loss Charge” shall mean the charges to each Market Participant, Network Customer, or Transmission Customer for the cost of energy lost in the transmission of electricity from a generation resource to load as specified in Section 5 of this Schedule.

1.3.38 Transmission Planned Outage.

“Transmission Planned Outage” shall mean any transmission outage scheduled in advance for a pre-determined duration and which meets the notification requirements for such outages specified in this Agreement or the PJM Manuals.

1.3.38A Variable Loads.

“Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.39 Zonal Base Load.

“Zonal Base Load” shall mean the lowest daily zonal peak load from the twelve month period ending October 21 of the calendar year immediately preceding the calendar year in which an annual Auction Revenue Right allocation is conducted, increased by the projected load growth rate for the relevant Zone.

1.5A Economic Load Response Participant.

As used in this section 1.5A, the term “end-use customer” refers to an individual location or aggregation of locations that consume electricity as identified by a unique electric distribution company account number.

1.5A.1 Qualification.

A Member or Special Member that is an end-use customer, Load Serving Entity or Curtailment Service Provider that has the ability to cause a reduction in demand as metered on an electric distribution company account basis or has an On-Site Generator that enables demand reduction may become an Economic Load Response Participant by complying with the requirements of the applicable Relevant Electric Retail Regulatory Authority and all other applicable federal, state and local regulatory entities together with this section 1.5A including, but not limited to, section 1.5A.3. A Member or Special Member may aggregate multiple individual end-use customer sites to qualify as an Economic Load Response Participant, subject to the requirements of Section 1.5A.10.

1.5A.2 Special Member.

Entities that are not Members and desire to participate solely in the Real-time Energy Market by reducing demand may become a Special Member by paying an annual membership fee of \$500 plus 10% of each payment owed by PJM Settlement for a Load Reduction Event not to exceed \$5,000 in a calendar year. For entities that become Special Members pursuant to this section, the following obligations are waived: (1) the \$1,500 membership application fee set forth in section 1.4.3 of this Agreement; (ii) liability under section 15.2 of this Agreement for Member defaults; (iii) thirty days notice for waiting period; and (iv) the requirement for 24/7 control center coverage. In addition, such Members shall not have voting privileges in committees or sector designations, and shall not be permitted to form user groups. On January 1 of a calendar year, a Special Member under this section, at its sole election, may become a Member rather than a Special Member subject to all rules governing being a Member, including regular application and membership fee requirements.

1.5A.3 Registration.

1. Prior to participating in the PJM Interchange Energy Market or Ancillary Services Market, Economic Load Response Participants must complete the Economic Load Response Registration Form posted on the Office of the Interconnection’s website and submit such form to the Office of the Interconnection for each end-use customer, or aggregation of end-use customers, pursuant to the requirements set forth in the PJM Manuals.

a. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the

appropriate electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is subject to another contractual obligation or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program, ~~and for confirmation of any associated transmission or distribution charges~~. The electric distribution company or Load Serving Entity shall have ten business days to respond. An electric distribution company or Load Serving Entity which seeks to assert that the laws or regulations of the Relevant Electric Retail Regulatory Authority prohibit or condition (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response program shall provide to PJM, within the referenced ten business day review period, either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

- ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall assume that the load to be reduced is not subject to other contractual obligations or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program, and the Office of the Interconnection shall accept the registration, provided it meets the requirements of this section 1.5A.

b. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:

- i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the appropriate electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is permitted to participate in PJM's Economic Load Response Program, ~~and, if permitted, confirmation of any associated transmission or distribution charges~~. The electric distribution company or Load Serving Entity shall have ten business days to respond. If the electric distribution company or Load Serving Entity verifies that the load that may be reduced is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then the electric distribution company or the Load

Serving Entity must provide to the Office of the Interconnection within the referenced ten business day review period evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

- ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall reject the registration. If it is able to do so in compliance with section 1.5A hereof, including section 1.5A.3, the Economic Load Response Participant may submit a new registration for consideration if a prior registration has been rejected pursuant to this subsection.

2. In the event that the end-use customer is subject to another contractual obligation, special settlement terms may be employed to accommodate such contractual obligation. The Office of the Interconnection shall notify the end-use customer or appropriate Curtailment Service Provider, electric distribution company or Load Serving Entity that the Economic Load Response Participant has or has not met the requirements of this section 1.5A. End-use customers that desire not to be simultaneously registered to reduce demand under the Emergency Load Response Program and under this section, upon one-day advance notice to the Office of the Interconnection, may switch its registration for reducing demand, if it has been registered to reduce load for 15 consecutive days under its current registration.

1.5A.3.01 Economic Load Response Registrations in Effect as of August 28, 2009

1. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

a. Effective as of the later of either August 28, 2009 (the effective date of Wholesale Competition in Regions with Organized Electric Markets, Order 719-A, 128 FERC ¶ 61,059 (2009) ("Order 719-A")) or the effective date of a Relevant Electric Retail Regulatory Authority law or regulation prohibiting or conditioning (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response Program, the existing Economic Load Response Participant's registration submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated upon an electric distribution company or Load Serving Entity

submitting to the Office of the Interconnection either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.

2. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:

a. Effective as of August 28, 2009 (the effective date of Order 719-A), an existing Economic Load Response Participant's registration submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated unless an electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program and provides evidence to the Office of the Interconnection documenting that the permission or conditional permission is pursuant to the laws or regulations of the Relevant Electric Retail Regulatory Authority. If the electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then, within ten business days of verifying such permission or conditional permission, the electric distribution company or Load Serving Entity must provide to the Office of the Interconnection evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and

conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.

3. All registrations submitted to the Office of the Interconnection on or after August 28, 2009, including requests to extend existing registrations, will be processed by the Office of the Interconnection in accordance with the provisions of section 1.5A, including section 1.5A.3.

1.5A.4 Metering and Electronic Dispatch Signal.

a) The Curtailment Service Provider is responsible to ensure that the Economic Load Response Participants have metering equipment that provides integrated hourly kWh values on an electric distribution company account basis. The metering equipment shall either meet the electric distribution company requirements for accuracy, or have a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment and associated data shall meet the requirements set forth herein and in the PJM Manuals. The Economic Load Response Participant must meter reductions in demand either by recording integrated hourly values for On-Site Generators running to serve local load (net of output used by the On-Site Generator), by metering load on an electric distribution company account basis and comparing actual metered load to its Customer Baseline Load, calculated pursuant to section 3.3A of this Schedule, or on an alternative metering basis approved by the Office of the Interconnection and agreed upon by all relevant parties, including any Curtailment Service Provider, Load Serving Entity and end-use customer. To qualify for compensation for such load reductions that are not metered directly by the Office of the Interconnection, hourly data reflecting meter readings for each ~~hour~~ day during ~~in~~ which the load reduction occurred and all associated days to determine the reduction must be submitted to the Office of the Interconnection in accordance with the PJM Manuals within 60 days of the load reduction.

b) Curtailment Service Providers shall be responsible for maintaining, or ensuring that Economic Load Response Participants maintain, the capability to receive and act upon an electronic dispatch signal from the Office of the Interconnection in accordance with any standards and specifications contained in the PJM Manuals.

1.5A.5 On-Site Generators.

An Economic Load Response Participant that intends to use an On-Site Generator for the purpose of reducing demand to participate in the PJM Interchange Energy Market shall represent to the Office of the Interconnection in writing that it holds all necessary environmental permits applicable to the operation of the On-Site Generator. Unless notified otherwise, the Office of the Interconnection shall deem such representation applies to each time the On-Site Generator is used to reduce demand to enable participation in the PJM Interchange Energy Market and that the On-Site Generator is being operated in compliance with all applicable permits, including any emissions, run-time limits or other operational constraints that may be imposed by such permits.

1.5A.6 ~~[Reserved for Future Use]~~ Variable-Load Customers.

The loads of an Economic Load Response Participant shall be categorized as Variable or Non-variable at the time the load is registered, based on hourly load data for the most recent 60 days provided by the participant in the registration process; provided, however, that any alternative means of making such determination when 60 days of data is not available shall be subject to review and approval by the Office of the Interconnection. Non-Variable Loads shall be those for which the Customer Baseline Load calculation and adjustment methods prescribed by sections 3.3A.2 and 3.3A.3 result in a relative root mean square hourly error of twenty percent or less compared to the actual hourly loads based on the hourly load data provided in the registration process and using statistical methods prescribed in the PJM Manuals. All other loads shall be Variable Loads.

1.5A.7 Non-Hourly Metered Customer Pilot.

Non-hourly metered customers may participate in the PJM Interchange Energy Market as Economic Load Response Participants on a pilot basis under the following circumstances. The customer or its Curtailment Service Provider or Load Serving Entity must propose an alternate method for measuring hourly demand reductions. The Office of the Interconnection shall approve alternate measurement mechanisms on a case-by-case basis for a time specified by the Office of the Interconnection (“Pilot Period”). In the event an alternative measurement mechanism is approved, the Office of the Interconnection shall notify the affected Load Serving Entity(ies) that a proposed alternate measurement mechanism has been approved for a Pilot Period. Demand reductions by non-hourly metered customers using alternate measurement mechanisms on a pilot basis shall be limited to a combined total of 500 MW of reductions in both the Emergency Load Response Program and the PJM Interchange Energy Market. With the sole exception of the requirement for hourly metering as set forth in Section 1.5A.4 of this Schedule, non-hourly metered customers that qualify as Economic Load Response Participants pursuant to this section 1.5A.7 shall be subject to the rules and procedures for participation by Economic Load Response Participants in the PJM Interchange Energy Market, including, without limitation, the Net Benefits Test and the requirement for dispatch by the Office of the Interconnection. Following completion of a Pilot Period, the alternate method shall be evaluated by the Office of the Interconnection to determine whether such alternate method should be included in the PJM Manuals as an accepted measurement mechanism for demand reductions in the PJM Interchange Energy Market.

1.5A.8 Batch Load Demand Resource Provision of Synchronized Reserve or Day-Ahead Scheduling Reserves.

(a) A Batch Load Demand Resource may provide Synchronized Reserve or Day-Ahead Scheduling Reserves in the PJM Interchange Energy Market provided it has pre-qualified by providing the Office of the Interconnection with documentation acceptable to the Office of the Interconnection that shows six months of one minute incremental load history of the Batch Load Demand Resource, or in the event such history is unavailable, other such information or data acceptable to the Office of the Interconnection to demonstrate that the resource meets the definition of “Batch Load Demand Resource” pursuant to section 1.3.1A.001 of this Schedule. This requirement is a one-time pre-qualification requirement for a Batch Load Demand Resource.

(b) Batch Load Demand Resources may provide up to 20 percent of the total system-wide PJM Synchronized Reserve requirement in any hour, or up to 20 percent of the total system-wide Day-Ahead Scheduling Reserves requirement in any hour; provided, however, that in the event the Office of the Interconnection determines in its sole discretion that satisfying 20 percent of either such requirement from Batch Load Demand Resources is causing or may cause a reliability degradation, the Office of the Interconnection may reduce the percentage of either such requirement that may be satisfied by Batch Load Demand Resources in any hour to as low as 10 percent. This reduction will be effective seven days after the posting of the reduction on the PJM website. Notwithstanding anything to the contrary in this Agreement, as soon as practicable, the Office of the Interconnection unilaterally shall make a filing under section 205 of the Federal Power Act to revise the rules for Batch Load Demand Resources so as to continue such reduction. The reduction shall remain in effect until the Commission acts upon the Office of the Interconnection's filing and thereafter if approved or accepted by the Commission.

(c) A Batch Load Demand Resource that is consuming energy at the start of a Synchronized Reserve Event, or, if committed to provide Day-Ahead Scheduling Reserves, at the time of a dispatch instruction from the Office of the Interconnection to reduce load, shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event, or to such instruction to reduce load, by reducing load as quickly as it is capable and by keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following the reduction, or, in the case of Day-Ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required. A Batch Load Demand Resource that has reduced its consumption of energy for its production processes to minimal or zero megawatts before the start of a Synchronized Reserve Event (or, in the case of Day-Ahead Scheduling Reserves, before a dispatch instruction to reduce load) shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event (or such instruction to reduce load) by reducing any load that is present at the time the Synchronized Reserve Event is called (or at the time of such instruction to reduce load) as quickly as it is capable, delaying the restart of its production processes, and keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following any such reduction (or, in the case of Day-Ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required). Failure to respond as described in this section shall be considered non-compliance with the Office of the Interconnection's dispatch instruction associated with a Synchronized Reserve Event, or as applicable, associated with an instruction to a resource committed to provide Day-Ahead Scheduling Reserves to reduce load.

1.5A.9 Day-ahead and Real-time Energy Market Participation.

Economic Load Response Participants ~~may shall be compensated under section 3.3A.5 and 3.3A.6 only if they~~ participate in the Day-ahead ~~and or~~ Real-time Energy Markets as a dispatchable ~~or self-scheduled~~ resources, ~~provided that Demand Resources that are self-scheduled pursuant to Section 1.5A.9(a) shall not be dispatched by the Office of the Interconnection pursuant to this section.~~

~~(a) — Self-scheduled Demand Resources shall be subject to the following requirements:~~

- ~~_____ i. _____ An Economic Load Response Participant self-scheduling a Demand Resource shall notify the Office of the Interconnection no less than 5 minutes prior to beginning a load reduction event and no more than 7 days prior to an event;~~
- ~~_____ ii. _____ Economic Load Response Participants may self-schedule a Demand Resource intra-hour;~~
- ~~_____ iii. _____ A Notification pursuant to this section may be withdrawn or adjusted downward during the relevant event hour, but not after the event hour;~~
- ~~_____ iv. _____ A Notification submitted pursuant to this section shall include the start and stop times of the event and the amount of the demand reduction;~~
- ~~_____ v. _____ The event period for self-scheduled Demand Resources shall be defined as all hours in the day for which the Economic Load Response Participant has provided a Notification.~~

1.5A.10 Economic Load Response Participant Aggregation.

The purpose for aggregation is to allow the participation of End-Use Customers in the Energy Market that can provide less than 100 kW of demand response when they currently have no alternative opportunity to participate on an individual basis or can provide less than 500 kW of demand response in the Day-Ahead Scheduling Reserve, Synchronized Reserve or Regulation markets when they currently have no alternative opportunity to participate on an individual basis. Aggregations pursuant to Section 1.5A.1 shall be subject to the following requirements:

- i. All End-Use Customers in an aggregation shall be specifically identified;
- ii. All End-Use Customers in an aggregation shall be served by the same electric distribution company or Load Serving Entity where the electric distribution company is the Load Serving Entity for all End-Use Customers in the aggregation. If the aggregation will provide Synchronized Reserves, all customers in the aggregation must also be part of the same Synchronized Reserve sub-zone;
- iii. All End-Use Customers in an aggregation that settle at Transmission Zone, existing load aggregate, or node prices shall be located in the same Transmission Zone, existing load aggregate or at the same node, respectively;
- iv. ~~If all End-Use Customers in an aggregation are not subject to the same generation and transmission charges, the generation and transmission charge for the aggregation shall be the load-weighted average of the generation and transmission charges for all End-Use Customers in the aggregation. The Economic Load Response Participant shall provide the load-weighted average, the calculation of the load-weighted average, and the supporting data to the Load Serving Entity and PJM. For the purposes of this section, the applicable generation and transmission charges are the charges an~~

~~End-Use Customer would have otherwise paid the Load Serving Entity absent the demand reduction;~~

~~v.~~ A single CBL for the aggregation shall be used to determine settlements pursuant to Sections 3.3A.45 and 3.3A.56;

vi. If the aggregation will only provide energy to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 99 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve. If the aggregation will provide an Ancillary Service to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 499 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve;

vii. Each End-Use Customer site must meet the requirements for market participation by a Demand Resource except for the 100 kW minimum load reduction requirement for energy or the 500 kW minimum load reduction requirement for Ancillary Services; and

viii. An End-Use Customer's participation in the Energy and Ancillary Services markets shall be administered under one economic registration.

1.5A.11 Reporting

(a) PJM will post on its website a report of demand response activity, and will provide a summary thereof to the PJM Markets and Reliability Committee on an annual basis.

(b) As PJM receives evidence from the electric distribution companies or Load Serving Entities pursuant to section 1.5A.3, PJM will post on its website a list of those Relevant Electric Retail Regulatory Authorities that the electric distribution companies or Load Serving Entities assert prohibit or condition retail participation in PJM's Economic Load Response Program together with a corresponding reference to the Relevant Electric Retail Regulatory Authority evidence that is provided to PJM by the electric distribution companies or Load Serving Entities.

1.7 General.

1.7.1 Market Sellers.

Only Market Sellers shall be eligible to submit offers to the Office of the Interconnection for the sale of electric energy or related services in the PJM Interchange Energy Market. Market Sellers shall comply with the prices, terms, and operating characteristics of all Offer Data submitted to and accepted by the PJM Interchange Energy Market.

1.7.2 Market Buyers.

Only Market Buyers shall be eligible to purchase energy or related services in the PJM Interchange Energy Market. Market Buyers shall comply with all requirements for making purchases from the PJM Interchange Energy Market.

1.7.2A Economic Load Response Participants.

Only Economic Load Response Participants shall be eligible to participate in the Real-time Energy Market and the Day-ahead Energy Market by submitting offers to the Office of the Interconnection to reduce demand.

1.7.3 Agents.

A Market Participant may participate in the PJM Interchange Energy Market through an agent, provided that the Market Participant informs the Office of the Interconnection in advance in writing of the appointment of such agent. A Market Participant participating in the PJM Interchange Energy Market through an agent shall be bound by all of the acts or representations of such agent with respect to transactions in the PJM Interchange Energy Market, and shall ensure that any such agent complies with the requirements of this Agreement.

1.7.4 General Obligations of the Market Participants.

(a) In performing its obligations to the Office of the Interconnection hereunder, each Market Participant shall at all times (i) follow Good Utility Practice, (ii) comply with all applicable laws and regulations, (iii) comply with the applicable principles, guidelines, standards and requirements of FERC, NERC and Applicable Regional Reliability Councils, (iv) comply with the procedures established for operation of the PJM Interchange Energy Market and PJM Region and (v) cooperate with the Office of the Interconnection as necessary for the operation of the PJM Region in a safe, reliable manner consistent with Good Utility Practice.

(b) Market Participants shall undertake all operations in or affecting the PJM Interchange Energy Market and the PJM Region including but not limited to compliance with all Emergency procedures, in accordance with the power and authority of the Office of the Interconnection with respect to the operation of the PJM Interchange Energy Market and the PJM Region as established in this Agreement, and as specified in the Schedules to this Agreement and the PJM Manuals. Failure to comply with the foregoing operational

requirements shall subject a Market Participant to such reasonable charges or other remedies or sanctions for non-compliance as may be established by the PJM Board, including legal or regulatory proceedings as authorized by the PJM Board to enforce the obligations of this Agreement.

(c) The Office of the Interconnection may establish such committees with a representative of each Market Participant, and the Market Participants agree to provide appropriately qualified personnel for such committees, as may be necessary for the Office of the Interconnection and PJMSettlement to perform its obligations hereunder.

(d) All Market Participants shall provide to the Office of the Interconnection the scheduling and other information specified in the Schedules to this Agreement, and such other information as the Office of the Interconnection may reasonably require for the reliable and efficient operation of the PJM Region and PJM Interchange Energy Market, and for compliance with applicable regulatory requirements for posting market and related information. Such information shall be provided as much in advance as possible, but in no event later than the deadlines established by the Schedules to this Agreement, or by the Office of the Interconnection in conformance with such Schedules. Such information shall include, but not be limited to, maintenance and other anticipated outages of generation or transmission facilities, scheduling and related information on bilateral transactions and self-scheduled resources, and implementation of active load management, interruption of load, and other load reduction measures. The Office of the Interconnection shall abide by appropriate requirements for the non-disclosure and protection of any confidential or proprietary information given to the Office of the Interconnection by a Market Participant. Each Market Participant shall maintain or cause to be maintained compatible information and communications systems, as specified by the Office of the Interconnection, required to transmit scheduling, dispatch, or other time-sensitive information to the Office of the Interconnection in a timely manner.

(e) Subject to the requirements for Economic Load Response Participants in section 1.5A above, each Market Participant shall install and operate, or shall otherwise arrange for, metering and related equipment capable of recording and transmitting all voice and data communications reasonably necessary for the Office of the Interconnection and PJMSettlement to perform the services specified in this Agreement. A Market Participant that elects to be separately billed for its PJM Interchange shall, to the extent necessary, be individually metered in accordance with Section 14 of this Agreement, or shall agree upon an allocation of PJM Interchange between it and the Market Participant through whose meters the unmetered Market Participant's PJM Interchange is delivered. The Office of the Interconnection shall be notified of the allocation by the foregoing Market Participants.

(f) Each Market Participant shall operate, or shall cause to be operated, any generating resources owned or controlled by such Market Participant that are within the PJM Region or otherwise supplying energy to or through the PJM Region in a manner that is consistent with the standards, requirements or directions of the Office of the Interconnection and that will permit the Office of the Interconnection to perform its obligations under this Agreement; provided, however, no Market Participant shall be required to take any action that is inconsistent with Good Utility Practice or applicable law.

(g) Each Market Participant shall follow the directions of the Office of the Interconnection to take actions to prevent, manage, alleviate or end an Emergency in a manner consistent with this Agreement and the procedures of the PJM Region as specified in the PJM Manuals.

(h) Each Market Participant shall obtain and maintain all permits, licenses or approvals required for the Market Participant to participate in the PJM Interchange Energy Market in the manner contemplated by this Agreement.

(i) Consistent with Section 36.1.1 of the PJM Tariff, to the extent its generating facility is dispatchable, a Market Participant shall submit an Economic Minimum in the Real-time Energy Market that is no greater than the higher of its physical operating minimum or its Capacity Interconnection Rights, as that term is defined in the PJM Tariff, associated with such generating facility under its Interconnection Service Agreement under Attachment O of the PJM Tariff or a wholesale market participation agreement.

1.7.5 Market Operations Center.

Each Market Participant shall maintain a Market Operations Center, or shall make appropriate arrangements for the performance of such services on its behalf. A Market Operations Center shall meet the performance, equipment, communications, staffing and training standards and requirements specified in this Agreement for the scheduling and completion of transactions in the PJM Interchange Energy Market and the maintenance of the reliable operation of the PJM Region, and shall be sufficient to enable (i) a Market Seller or an Economic Load Response Participant to perform all terms and conditions of its offers to the PJM Interchange Energy Market, and (ii) a Market Buyer or an Economic Load Response Participant to conform to the requirements for purchasing from the PJM Interchange Energy Market.

1.7.6 Scheduling and Dispatching.

(a) The Office of the Interconnection shall schedule and dispatch in real-time generation resources and/or Demand Resources economically on the basis of least-cost, security-constrained dispatch and the prices and operating characteristics offered by Market Sellers, continuing until sufficient generation resources and/or Demand Resources are dispatched to serve the PJM Interchange Energy Market energy purchase requirements under normal system conditions of the Market Buyers, as well as the requirements of the PJM Region for ancillary services provided by generation resources and/or Demand Resources, in accordance with this Agreement. Such scheduling and dispatch shall recognize transmission constraints on coordinated flowgates external to the Transmission System in accordance with Appendix A to the Joint Operating Agreement between the Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C. (PJM Rate Schedule FERC No. 38) and on other such flowgates that are coordinated in accordance with agreements between the LLC and other entities. Scheduling and dispatch shall be conducted in accordance with this Agreement.

(b) The Office of the Interconnection shall undertake to identify any conflict or incompatibility between the scheduling or other deadlines or specifications applicable to the PJM Interchange Energy Market, and any relevant procedures of another Control Area, or any tariff (including the PJM Tariff). Upon determining that any such conflict or incompatibility exists, the Office of the Interconnection shall propose tariff or procedural changes, and undertake such other efforts as may be appropriate, to resolve any such conflict or incompatibility.

(c) To protect its generation or distribution facilities, or local Transmission Facilities not under the monitoring responsibility and dispatch control of the Office of the Interconnection, an entity may request that the Office of the Interconnection schedule and dispatch generation or reductions in demand to meet a limit on Transmission Facilities different from that which the Office of the Interconnection has determined to be required for reliable operation of the Transmission System. To the extent consistent with its other obligations under this Agreement, the Office of the Interconnection shall schedule and dispatch generation and reductions in demand in accordance with such request. An entity that makes a request pursuant to this section 1.7.6(c) shall be responsible for all generation and other costs resulting from its request that would not have been incurred by operating the Transmission System and scheduling and dispatching generation in the manner that the Office of the Interconnection otherwise has determined to be required for reliable operation of the Transmission System.

1.7.7 Pricing.

The price paid for energy bought and sold in the PJM Interchange Energy Market and for demand reductions will reflect the hourly Locational Marginal Price at each load and generation bus, determined by the Office of the Interconnection in accordance with this Agreement. Transmission Congestion Charges and Transmission Loss Charges, which shall be determined by differences in Congestion Prices and Loss Prices in an hour, shall be calculated by the Office of the Interconnection, and collected by PJMSettlement, and the revenues therefrom shall be disbursed by PJMSettlement in accordance with this Schedule.

1.7.8 Generating Market Buyer Resources.

A Generating Market Buyer may elect to self-schedule its generation resources up to that Generating Market Buyer's Equivalent Load, in accordance with and subject to the procedures specified in this Schedule, and the accounting and billing requirements specified in Section 3 to this Schedule. PJMSettlement shall not be a contracting party with respect to such self-scheduled or self-supplied transactions.

1.7.9 Delivery to an External Market Buyer.

A purchase of Spot Market Energy by an External Market Buyer shall be delivered to a bus or busses at the electrical boundaries of the PJM Region specified by the Office of the Interconnection, or to load in such area that is not served by Network Transmission Service, using Point-to-Point Transmission Service paid for by the External Market Buyer. Further delivery of such energy shall be the responsibility of the External Market Buyer.

1.7.10 Other Transactions.

(a) **Bilateral Transactions.**

(i) In addition to transactions in the PJM Interchange Energy Market, Market Participants may enter into bilateral contracts for the purchase or sale of electric energy to or from each other or any other entity, subject to the obligations of Market Participants to make Generation Capacity Resources available for dispatch by the Office of the Interconnection. Such bilateral contracts shall be for the physical transfer of energy to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eSchedules and Enhanced Energy Scheduler tools.

(ii) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of energy to a Market Participant inside the PJM Region, title to the energy that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and the further transmission of the energy or further sale of the energy into the PJM Interchange Energy Market shall be transacted by the buyer under the bilateral contract. With respect to all bilateral contracts for the physical transfer of energy to an entity outside the PJM Region, title to the energy shall pass to the buyer at the border of the PJM Region and shall be delivered to the border using transmission service. In no event shall the purchase and sale of energy between Market Participants under a bilateral contract constitute a transaction in the PJM Interchange Energy Market or be construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.

(iii) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of energy reported to and coordinated with the Office of the Interconnection under this Schedule shall use all reasonable efforts, consistent with Good Utility Practice, to limit the megawatt hours of such reported transactions to amounts reflecting the expected load and other physical delivery obligations of the buyer under the bilateral contract.

(iv) All payments and related charges for the energy associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection or PJMSettlement. The LLC, PJMSettlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.

(v) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any Spot Market Backup used to meet the bilateral contract seller's obligation to deliver energy under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the

Interconnection shall (i) not accept any new eSchedules or Enhanced Energy Scheduler reporting by the Market Participant and (ii) terminate all of the Market Participant's eSchedules and Enhanced Energy Schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the eSchedules and Enhanced Energy Schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection. PJMSettlement shall assign its claims against a seller with respect to a seller's nonpayment for Spot Market Backup to a buyer to the extent that the buyer has made an indemnification payment to PJMSettlement with respect to the seller's nonpayment.

(vi) Bilateral contracts that do not contemplate the physical transfer of energy to or from a Market Participant are not subject to this Schedule, shall not be reported to and coordinated with the Office of the Interconnection, and shall not in any way constitute a transaction in the PJM Interchange Energy Market.

(b) Market Participants shall have Spot Market Backup with respect to all bilateral transactions that contemplate the physical transfer of energy to or from a Market Participant, that are not dynamically scheduled pursuant to Section 1.12 and that are curtailed or interrupted for any reason (except for curtailments or interruptions through active load management for load located within the PJM Region).

(c) To the extent the Office of the Interconnection dispatches a Generating Market Buyer's generation resources, such Generating Market Buyer may elect to net the output of such resources against its hourly Equivalent Load. Such a Generating Market Buyer shall be deemed a buyer from the PJM Interchange Energy Market to the extent of its PJM Interchange Imports, and shall be deemed a seller to the PJM Interchange Energy Market to the extent of its PJM Interchange Exports.

(d) A Market Seller may self-supply Station Power for its generation facility in accordance with the following provisions:

(i) A Market Seller may self-supply Station Power for its generation facility during any month (1) when the net output of such facility is positive, or (2) when the net output of such facility is negative and the Market Seller during the same month has available at other of its generation facilities positive net output in an amount at least sufficient to offset fully such negative net output. For purposes of this subsection (d), "net output" of a generation facility during any month means the facility's gross energy output, less the Station Power requirements of such facility, during that month. The determination of a generation facility's or a Market Seller's monthly net output under this subsection (d) will apply only to determine whether the Market Seller self-supplied Station Power during the month and will not affect the price of energy sold or consumed by the Market Seller at any bus during any hour during the month. For each hour when a Market Seller has positive net output and delivers energy into the Transmission System, it

will be paid the LMP at its bus for that hour for all of the energy delivered. Conversely, for each hour when a Market Seller has negative net output and has received Station Power from the Transmission System, it will pay the LMP at its bus for that hour for all of the energy consumed.

(ii) Transmission Provider will determine the extent to which each affected Market Seller during the month self-supplied its Station Power requirements or obtained Station Power from third-party providers (including affiliates) and will incorporate that determination in its accounting and billing for the month. In the event that a Market Seller self-supplies Station Power during any month in the manner described in subsection (1) of subsection (d)(i) above, Market Seller will not use, and will not incur any charges for, transmission service. In the event, and to the extent, that a Market Seller self-supplies Station Power during any month in the manner described in subsection (2) of subsection (d)(i) above (hereafter referred to as “remote self-supply of Station Power”), Market Seller shall use and pay for transmission service for the transmission of energy in an amount equal to the facility’s negative net output from Market Seller’s generation facility(ies) having positive net output. Unless the Market Seller makes other arrangements with Transmission Provider in advance, such transmission service shall be provided under Part II of the PJM Tariff and shall be charged the hourly rate under Schedule 8 of the PJM Tariff for Non-Firm Point-to-Point Transmission Service with an election to pay congestion charges, provided, however, that no reservation shall be necessary for such transmission service and the terms and charges under Schedules 1, 1A, 2 through 6, 9 and 10 of the PJM Tariff shall not apply to such service. The amount of energy that a Market Seller transmits in conjunction with remote self-supply of Station Power will not be affected by any other sales, purchases, or transmission of capacity or energy by or for such Market Seller under any other provisions of the PJM Tariff.

(iii) A Market Seller may self-supply Station Power from its generation facilities located outside of the PJM Region during any month only if such generation facilities in fact run during such month and Market Seller separately has reserved transmission service and scheduled delivery of the energy from such resource in advance into the PJM Region.

1.7.11 Emergencies.

(a) The Office of the Interconnection, with the assistance of the Members’ dispatchers as it may request, shall be responsible for monitoring the operation of the PJM Region, for declaring the existence of an Emergency, and for directing the operations of Market Participants as necessary to manage, alleviate or end an Emergency. The standards, policies and procedures of the Office of the Interconnection for declaring the existence of an Emergency, including but not limited to a Minimum Generation Emergency, and for managing, alleviating or ending an Emergency, shall apply to all Members on a non-discriminatory basis. Actions by the Office of the Interconnection and the Market Participants shall be carried out in accordance with this Agreement, the NERC Operating Policies, Applicable Regional Reliability Council reliability principles and standards, Good Utility Practice, and the PJM Manuals. A declaration that an Emergency exists or is likely to exist by the Office of the Interconnection shall be binding

on all Market Participants until the Office of the Interconnection announces that the actual or threatened Emergency no longer exists. Consistent with existing contracts, all Market Participants shall comply with all directions from the Office of the Interconnection for the purpose of managing, alleviating or ending an Emergency. The Market Participants shall authorize the Office of the Interconnection and PJMSettlement to purchase or sell energy on their behalf to meet an Emergency, and otherwise to implement agreements with other Control Areas interconnected with the PJM Region for the mutual provision of service to meet an Emergency, in accordance with this Agreement.

(b) To the extent load must be shed to alleviate an Emergency in a Control Zone, the Office of the Interconnection shall, to the maximum extent practicable, direct the shedding of load within such Control Zone. The Office of the Interconnection may shed load in one Control Zone to alleviate an Emergency in another Control Zone under its control only as necessary after having first shed load to the maximum extent practicable in the Control Zone experiencing the Emergency and only to the extent that PJM supports other control areas (not under its control) in those situations where load shedding would be necessary, such as to prevent isolation of facilities within the Eastern Interconnection, to prevent voltage collapse, or to restore system frequency following a system collapse; provided, however, that the Office of the Interconnection may not order a manual load dump in a Control Zone solely to address capacity deficiencies in another Control Zone. This section shall be implemented consistent with the North American Electric Reliability Council and applicable reliability council standards.

1.7.12 Fees and Charges.

Each Market Participant, except for Special Members, shall pay all fees and charges of the Office of the Interconnection for operation of the PJM Interchange Energy Market as determined by and allocated to the Market Participant by the Office of the Interconnection in accordance with Schedule 3.

1.7.13 Relationship to the PJM Region.

The PJM Interchange Energy Market operates within and subject to the requirements for the operation of the PJM Region.

1.7.14 PJM Manuals.

The Office of the Interconnection shall be responsible for maintaining, updating, and promulgating the PJM Manuals as they relate to the operation of the PJM Interchange Energy Market. The PJM Manuals, as they relate to the operation of the PJM Interchange Energy Market, shall conform and comply with this Agreement, NERC operating policies, and Applicable Regional Reliability Council reliability principles, guidelines and standards, and shall be designed to facilitate administration of an efficient energy market within industry reliability standards and the physical capabilities of the PJM Region.

1.7.15 Corrective Action.

Consistent with Good Utility Practice, the Office of the Interconnection shall be authorized to direct or coordinate corrective action, whether or not specified in the PJM Manuals, as necessary to alleviate unusual conditions that threaten the integrity or reliability of the PJM Region, or the regional power system.

1.7.16 Recording.

Subject to the requirements of applicable State or federal law, all voice communications with the Office of the Interconnection Control Center may be recorded by the Office of the Interconnection and any Market Participant communicating with the Office of the Interconnection Control Center, and each Market Participant hereby consents to such recording.

1.7.17 Operating Reserves.

(a) The following procedures shall apply to any generation unit subject to the dispatch of the Office of the Interconnection for which construction commenced before July 9, 1996, or any Demand Resource subject to the dispatch of the Office of the Interconnection.

(b) The Office of the Interconnection shall schedule to the Operating Reserve and load-following objectives of the Control Zones of the PJM Region and the PJM Interchange Energy Market in scheduling generation resources and/or Demand Resources pursuant to this Schedule. A table of Operating Reserve objectives for each Control Zone is calculated and published annually in the PJM Manuals. Reserve levels are probabilistically determined based on the season's historical load forecasting error and forced outage rates.

(c) Nuclear generation resources shall not be eligible for Operating Reserve payments unless: 1) the Office of the Interconnection directs such resources to reduce output, in which case, such units shall be compensated in accordance with section 3.2.3(f) of this Schedule; or 2) the resource submits a request for a risk premium to the Market Monitoring Unit under the procedures specified in Section II.B of Attachment M - Appendix. A nuclear generation resource (i) must submit a risk premium consistent with its agreement under such process, or, (ii) if it has not agreed with the Market Monitoring Unit on an appropriate risk premium, may submit its own determination of an appropriate risk premium to the Office of the Interconnection, subject to acceptance by the Office of the Interconnection, with or without prior approval from the Commission.

(d) PJMSettlement shall be the Counterparty to the purchases and sales of Operating Reserve in the PJM Interchange Energy Market.

1.7.18 Regulation.

(a) Regulation to meet the Regulation objective of each Regulation Zone shall be supplied from generation resources and/or Demand Resources located within the metered electrical boundaries of such Regulation Zone. Generating Market Buyers, and Market Sellers offering Regulation, shall comply with applicable standards and requirements for Regulation capability and dispatch specified in the PJM Manuals.

(b) The Office of the Interconnection shall obtain and maintain for each Regulation Zone an amount of Regulation equal to the Regulation objective for such Regulation Zone as specified in the PJM Manuals.

(c) The Regulation range of a generation unit or Demand Resource shall be at least twice the amount of Regulation assigned.

(d) A generation unit capable of automatic energy dispatch that is also providing Regulation shall have its energy dispatch range reduced by twice the amount of the Regulation provided. The amount of Regulation provided by a generation unit shall serve to redefine the Normal Minimum Generation and Normal Maximum Generation energy limits of that generation unit, in that the amount of Regulation shall be added to the generation unit's Normal Minimum Generation energy limit, and subtracted from its Normal Maximum Generation energy limit.

(e) Qualified Regulation must satisfy the verification tests described in the PJM Manuals.

1.7.19 Ramping.

A generator dispatched by the Office of the Interconnection pursuant to a control signal appropriate to increase or decrease the generator's megawatt output level shall be able to change output at the ramping rate specified in the Offer Data submitted to the Office of the Interconnection for that generator.

1.7.19A Synchronized Reserve.

(a) Synchronized Reserve shall be supplied from generation resources and/or Demand Resources located within the metered boundaries of the PJM Region. Generating Market Buyers, and Market Sellers offering Synchronized Reserve shall comply with applicable standards and requirements for Synchronized Reserve capability and dispatch specified in the PJM Manuals

(b) The Office of the Interconnection shall obtain and maintain for each Synchronized Reserve Zone an amount of Synchronized Reserve equal to the Synchronized Reserve objective for such Synchronized Reserve Zone, as specified in the PJM Manuals.

(c) The Synchronized Reserve capability of a generation resource and Demand Resource shall be the increase in energy output or load reduction achievable by the generation resource and Demand Resource within a continuous 10-minute period.

(d) A generation unit capable of automatic energy dispatch that also is providing Synchronized Reserve shall have its energy dispatch range reduced by the amount of the Synchronized Reserve provided. The amount of Synchronized Reserve provided by a generation unit shall serve to redefine the Normal Maximum Generation energy limit of that generation unit

in that the amount of Synchronized Reserve provided shall be subtracted from its Normal Maximum Generation energy limit.

1.7.19B Bilateral Transactions Regarding Regulation, Synchronized Reserve and Day-ahead Scheduling Reserves.

(a) In addition to transactions in the Regulation market, Synchronized Reserve market, and Day-ahead Scheduling Reserves Market, Market Participants may enter into bilateral contracts for the purchase or sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from each other or any other entity. Such bilateral contracts shall be for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eMarket tools.

(b) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to a Market Participant in the PJM Region, title to the product that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and any further transactions associated with such products or further sale of such Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves in the markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, respectively, shall be transacted by the buyer under the bilateral contract. In no event shall the purchase and sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves between Market Participants under a bilateral contract constitute a transaction in PJM's markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, or otherwise be construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.

(c) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves reported to and coordinated with the Office of the Interconnection under this Schedule shall use all reasonable efforts, consistent with Good Utility Practice, to limit the amounts of such reported transactions to amounts reflecting the expected requirements for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves of the buyer pursuant to such bilateral contracts.

(d) All payments and related charges for the Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection. The LLC, PJMSettlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.

(e) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any purchases by the seller under the bilateral contract in the markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling

Reserves used to meet the bilateral contract seller's obligation to deliver Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the Interconnection shall (i) not accept any new eMarket reporting by the Market Participant and (ii) terminate all of the Market Participant's reporting of eMarkets schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the reported eMarkets schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection.

(f) Market Participants shall purchase Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves from PJM's markets for Regulation, Synchronized Reserve, Day-ahead Scheduling Reserves, in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason, with respect to all bilateral transactions that contemplate the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant.

1.7.20 Communication and Operating Requirements.

(a) Market Participants. Each Market Participant shall have, or shall arrange to have, its transactions in the PJM Interchange Energy Market subject to control by a Market Operations Center, with staffing and communications systems capable of real-time communication with the Office of the Interconnection during normal and Emergency conditions and of control of the Market Participant's relevant load or facilities sufficient to meet the requirements of the Market Participant's transactions with the PJM Interchange Energy Market, including but not limited to the following requirements as applicable.

(b) Market Sellers selling from generation resources and/or Demand Resources within the PJM Region shall: report to the Office of the Interconnection sources of energy and Demand Resources available for operation; supply to the Office of the Interconnection all applicable Offer Data; report to the Office of the Interconnection generation resources ~~and Demand Resources~~ that are self-scheduled; with respect to generation resources, report to the Office of the Interconnection bilateral sales transactions to buyers not within the PJM Region; confirm to the Office of the Interconnection bilateral sales to Market Buyers within the PJM Region; respond to the Office of the Interconnection's directives to start, shutdown or change output levels of generation units, or change scheduled voltages or reactive output levels of generation units, or reduce load from Demand Resources; continuously maintain all Offer Data concurrent with on-line operating information; and ensure that, where so equipped, generating equipment and Demand Resources are operated with control equipment functioning as specified in the PJM Manuals.

(c) Market Sellers selling from generation resources outside the PJM Region shall: provide to the Office of the Interconnection all applicable Offer Data, including offers specifying amounts of energy available, hours of availability and prices of energy and other services; respond to Office of the Interconnection directives to schedule delivery or change delivery schedules; and communicate delivery schedules to the Market Seller's Control Area.

(d) Market Participants that are Load Serving Entities or purchasing on behalf of Load Serving Entities shall: respond to Office of the Interconnection directives for load management steps; report to the Office of the Interconnection Generation Capacity Resources to satisfy capacity obligations that are available for pool operation; report to the Office of the Interconnection all bilateral purchase transactions; respond to other Office of the Interconnection directives such as those required during Emergency operation.

(e) Market Participants that are not Load Serving Entities or purchasing on behalf of Load Serving Entities shall: provide to the Office of the Interconnection requests to purchase specified amounts of energy for each hour of the Operating Day during which it intends to purchase from the PJM Interchange Energy Market, along with Dispatch Rate levels above which it does not desire to purchase; respond to other Office of the Interconnection directives such as those required during Emergency operation.

(f) Economic Load Response Participants are responsible for maintaining demand reduction information, including the amount and price at which demand may be reduced. The Economic Load Response Participant shall provide this information to the Office of the Interconnection by posting it on the Load Response Program Registration link of the PJM website as required by the PJM Manuals. The Economic Load Response Participant shall notify the Office of the Interconnection of a demand reduction concurrent with, or prior to, the beginning of such demand reduction in accordance with the PJM Manuals. In the event that an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer that would affect a relevant Customer Baseline Load as required by the PJM Manuals.

2.2 General.

The Office of the Interconnection shall determine the least cost security-constrained dispatch, which is the least costly means of serving load at different locations in the PJM Region based on actual operating conditions existing on the power grid (including transmission constraints on external coordinated flowgates to the extent provided by section 1.7.6) and on the prices at which Market Sellers have offered to supply energy and offers by Economic Load Response Participants to reduce demand that qualify to set Locational Marginal Prices in the PJM Interchange Energy Market. Locational Marginal Prices for the generation and load busses in the PJM Region, including interconnections with other Control Areas, will be calculated based on the actual economic dispatch and the prices of energy and demand reduction offers. The process for the determination of Locational Marginal Prices shall be as follows:

(a) To determine actual operating conditions on the power grid in the PJM Region, the Office of the Interconnection shall use a computer model of the interconnected grid that uses available metered inputs regarding generator output, loads, and power flows to model remaining flows and conditions, producing a consistent representation of power flows on the network. The computer model employed for this purpose, referred to as the State Estimator program, is a standard industry tool and is described in Section 2.3 below. It will be used to obtain information regarding the output of generation supplying energy to the PJM Region, loads at busses in the PJM Region, transmission losses, and power flows on binding transmission constraints for use in the calculation of Locational Marginal Prices. Additional information used in the calculation, including Dispatch Rates and real time schedules for external transactions between PJM and other Control Areas and dispatch and pricing information from entities with whom PJM has executed a joint operating agreement, will be obtained from the Office of the Interconnection's dispatchers.

(b) Using the prices at which energy is offered by Market Sellers and demand reductions are offered by Economic Load Response Participants to the PJM Interchange Energy Market, the Office of the Interconnection shall determine the offers of energy and demand reductions that will be considered in the calculation of Locational Marginal Prices. As described in Section 2.4 below, every qualified offer for demand reduction and of energy by a Market Seller from resources that are following economic dispatch instructions of the Office of the Interconnection will be utilized in the calculation of Locational Marginal Prices, including, without limitation, qualified offers from Economic Load Response Participants in either the Day-Ahead or Real-Time Energy Markets that satisfy the Net Benefits Test. Offers of demand reduction from Demand Resources in the Real-time Energy Market will not be eligible to set Locational Marginal Prices, unless metered directly by the Office of the Interconnection.

(c) Based on the system conditions on the PJM power grid, determined as described in (a), and the eligible energy and demand reduction offers, determined as described in (b), the Office of the Interconnection shall determine the least costly means of obtaining energy to serve the next increment of load at each bus in the PJM Region, in the manner described in Section 2.5 below. The result of that calculation shall be a set of Locational Marginal Prices based on the system conditions at the time.

3.2 Market Buyers.

3.2.1 Spot Market Energy Charges.

(a) The Office of the Interconnection shall calculate System Energy Prices in the form of Day-ahead System Energy Prices and Real-time System Energy Prices for the PJM Region, in accordance with Section 2 of this Schedule

(b) Market Buyers shall be charged for all load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) scheduled to be served from the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price .

(c) Generating Market Buyers shall be paid for all energy scheduled to be delivered to the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price.

(d) At the end of each hour during an Operating Day, the Office of the Interconnection shall calculate the total amount of net hourly PJM Interchange for each Market Buyer, including Generating Market Buyers, in accordance with the PJM Manuals. For Internal Market Buyers that are Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall include determination of the net energy flows from: (i) tie lines; (ii) any generation resource the output of which is controlled by the Market Buyer but delivered to it over another entity's Transmission Facilities; (iii) any generation resource the output of which is controlled by another entity but which is directly interconnected with the Market Buyer's transmission system; (iv) deliveries pursuant to bilateral energy sales; (v) receipts pursuant to bilateral energy purchases; and (vi) an adjustment to account for the day-ahead PJM Interchange, calculated as the difference between scheduled withdrawals and injections by that Market Buyer in the Day-ahead Energy Market. For External Market Buyers and Internal Market Buyers that are not Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall determine the energy scheduled hourly for delivery to the Market Buyer net of the amounts scheduled by the External Market Buyer in the Day-ahead Energy Market.

(e) An Internal Market Buyer shall be charged for Spot Market Energy purchases to the extent of its hourly net purchases from the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. An External Market Buyer shall be charged for its Spot Market Energy purchases based on the energy delivered to it, determined as specified in Section 3.2.1(d) above. The total charge shall be determined by the product of the hourly net amount of PJM Interchange Imports times the hourly Real-time System Energy Price for that Market Buyer.

(f) A Generating Market Buyer shall be paid as a Market Seller for sales of Spot Market Energy to the extent of its hourly net sales into the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. The total payment shall be determined by the product of the hourly net amount of PJM Interchange Exports times the hourly Real-time System Energy Price for that Market Seller.

3.2.2 Regulation.

(a) Each Internal Market Buyer that is a Load Serving Entity in a Regulation Zone shall have an hourly Regulation objective equal to its pro rata share of the Regulation requirements of such Regulation Zone for the hour, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Regulation Zone for the hour ("Regulation Obligation"). An Internal Market Buyer that does not meet its hourly Regulation obligation shall be charged for Regulation dispatched by the Office of the Interconnection to meet such obligation at the Regulation market-clearing price determined in accordance with subsection (c) of this section, plus the amounts, if any, described in subsection (f) of this section.

(b) A Generating Market Buyer supplying Regulation in a Regulation Zone at the direction of the Office of the Interconnection in excess of its hourly Regulation obligation shall be credited for each increment of such Regulation at the higher of (i) the Regulation market-clearing price in such Regulation Zone or (ii) the sum of the regulation offer and the unit-specific opportunity cost of the generation resource supplying the increment of Regulation, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(c) The Regulation market-clearing price in each Regulation Zone shall be determined at a time to be determined by the Office of the Interconnection which shall be no earlier than the day before the Operating Day. The market-clearing price for each regulating hour shall be equal to the highest sum of a resource's Regulation offer plus its estimated unit-specific opportunity costs, determined as described in subsection (d) below from among the resources selected to provide Regulation. A resource's Regulation offer by any Market Seller that fails the three-pivotal supplier test set forth in section 3.3.2A.1 of this Schedule shall not exceed the cost of providing Regulation from such resource, plus twelve dollars, as determined pursuant to the formula in section 1.10.1A(e) of this Schedule.

(d) In determining the Regulation market-clearing price for each Regulation Zone, the estimated unit-specific opportunity costs of a generation resource offering to sell Regulation in each regulating hour shall be equal to the sum of the unit-specific opportunity costs (i) incurred during the hour in which the obligation is fulfilled, plus costs (ii) associated with uneconomic operation during the hour preceding the initial regulating hour ("preceding shoulder hour"), plus costs (iii) associated with uneconomic operation during the hour after the final regulating hour ("following shoulder hour").

The unit-specific opportunity costs incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the set point of the generation resource that is expected to be required in order to provide Regulation from the generation resource's expected output level if it had been dispatched in economic merit order times, (ii) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource) in the PJM Interchange Energy Market.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (a) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to provide Regulation and the resource's expected output during the preceding shoulder hour, times (b) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource during the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (c) the percentage of the preceding shoulder hour during which the deviation was incurred.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (a) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the resource's expected output in the following shoulder hour, times (b) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market, times (c) the percentage of the following shoulder hour that the deviation was incurred.

Estimated opportunity costs for Demand Resources to provide Regulation are zero.

(e) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Regulation in a Regulation Zone and that actively follows the Office of the Interconnection's Regulation signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Regulation, and for the percentage of the preceding shoulder hour and the following shoulder hour during which the Generating Market Buyer or Market Seller provided Regulation. The unit-specific opportunity cost incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's Regulation signals from the generation resource's expected output level if it had been dispatched in economic merit order times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the actual megawatt level of the resource when the actual megawatt level is within the tolerance defined in the PJM Manuals for the Regulation set point, or at the Regulation set point for the resource when it is not within the corresponding tolerance) in the PJM Interchange Energy Market. Opportunity costs for Demand Resources to provide Regulation are zero.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to

provide Regulation and the lesser of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the preceding shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the following shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the following shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the following shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(f) Any amounts credited for Regulation in an hour in excess of the Regulation market-clearing price in that hour shall be allocated and charged to each Internal Market Buyer in a Regulation Zone that does not meet its hourly Regulation obligation in proportion to its purchases of Regulation in such Regulation Zone in megawatt-hours during that hour.

3.2.2A Offer Price Caps.

3.2.2A.1 Applicability.

(a) Each hour, the Office of the Interconnection shall conduct a three-pivotal supplier test as described in this section. Regulation offers from Market Sellers that fail the three-pivotal supplier test shall be capped in the hour in which they failed the test at their cost based offers as determined pursuant to section 1.10.1A(e) of this Schedule. A Regulation supplier fails the three-pivotal supplier test in any hour in which such Regulation supplier and the two largest other Regulation suppliers are jointly pivotal.

(b) For the purposes of conducting the three-pivotal supplier test pursuant to this section, the following applies:

(i) The three-pivotal supplier test will include in the definition of available supply all offers from resources capable of satisfying the Regulation requirement of the PJM Region for which the cost-based offer plus any eligible opportunity costs is no greater than 150 percent of the clearing price that would be calculated if all offers were limited to cost (plus eligible opportunity costs).

(ii) The three-pivotal supplier test will apply on a Regulation supplier basis (i.e. not a resource by resource basis) and only the Regulation suppliers that fail the three-pivotal supplier test will have their Regulation offers capped. A Regulation supplier for the purposes of this section includes corporate affiliates. Regulation from resources controlled by a Regulation supplier or its affiliates, whether by contract with unaffiliated third parties or otherwise, will be included as Regulation of that Regulation supplier. Regulation provided by resources owned by a Regulation supplier but controlled by an unaffiliated third party, whether by contract or otherwise, will be included as Regulation of that third party.

3.2.3 Operating Reserves.

(a) A Market Seller's pool-scheduled resources capable of providing Operating Reserves shall be credited as specified below based on the prices offered for the operation of such resource, provided that the resource was available for the entire time specified in the Offer Data for such resource. To the extent that Section 3.2.A.01 of Schedule 1 of this Agreement does not meet the Day-ahead Scheduling Reserves Requirement, the Office of the Interconnection shall schedule additional Operating Reserves pursuant to Section 1.7.17 and 1.10 of Schedule 1 of this Agreement. In addition the Office of the Interconnection shall schedule Operating Reserves pursuant to those sections to satisfy any unforeseen Operating Reserve requirements that are not reflected in the Day-ahead Scheduling Reserves Requirement.

(b) The following determination shall be made for each pool-scheduled resource that is scheduled in the Day-ahead Energy Market: the total offered price for start-up and no-load fees and energy, determined on the basis of the resource's scheduled output, shall be compared to the total value of that resource's energy – as determined by the Day-ahead Energy Market and the Day-ahead Prices applicable to the relevant generation bus in the Day-ahead Energy Market. Except as provided in Section 3.2.3(n), if the total offered price summed over all hours exceeds the total value summed over all hours, the difference shall be credited to the Market Seller. The Office of the Interconnection shall apply any balancing Operating Reserve credits allocated pursuant to this Section 3.2.3(b) to real-time deviations from day-ahead schedules or real-time load share plus exports, pursuant to Section 3.2.3(p), depending on whether the balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

(i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve

credits shall be allocated based on the reason the resource was scheduled according to the following provisions:

(A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve credits, identified as RA Credits for Deviations, shall be allocated to real-time deviations from day-ahead schedules.

(B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve credits, identified as RA Credits for Reliability, shall be allocated according to ratio share of real time load plus export transactions.

(C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve credits shall be segmented and separately allocated pursuant to subsections 3.2.3(b)(i)(A) or 3.2.3(b)(i)(B) hereof. Balancing Operating Reserve credits for such resources will be identified in the same manner as units committed during the reliability analysis pursuant to subsections 3.2.3(b)(i)(A) and 3.2.3(b)(i)(B) hereof.

(ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve credits shall be allocated according to the following provisions:

(A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve credits, identified as RT Credits for Reliability, shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, credits will be applied pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the credits for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category (RT Credits for Reliability or RT Credits for Deviations) as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(b)(ii)(A) hereof to operate in real-time during an Operating Day, the associated balancing Operating Reserve credits, identified as RT Credits for Deviations, shall be allocated according to real-time deviations from day-ahead schedules.

(iii) PJM shall post on its Web site the aggregate amount of MWs committed that meet the criteria referenced in subsections (b)(i) and (b)(ii) hereof.

(c) The sum of the foregoing credits calculated in accordance with Section 3.2.3(b) plus any unallocated charges from Section 3.2.3(h) and 5.1.7 and any shortfalls paid pursuant to the Market Settlement provision of the Day-ahead Economic Load Response Program, shall be the cost of Operating Reserves in the Day-ahead Energy Market.

(d) The cost of Operating Reserves in the Day-ahead Energy Market shall be allocated and charged to each Market Participant in proportion to the sum of its (i) scheduled load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) and accepted Decrement Bids in the Day-ahead Energy Market in megawatt-hours for that Operating Day; and (ii) scheduled energy sales in the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours for that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such area pursuant to Section 1.12.

(e) At the end of each Operating Day, the following determination shall be made for each synchronized pool-scheduled resource of each Market Seller that operates as requested by the Office of the Interconnection and that is not committed solely for the purpose of providing Synchronized Reserve: For each calendar day, pool-scheduled resources in the Real-time Energy Market shall be made whole for each of the following segments: 1) the greater of their day-ahead schedules or minimum run time (minimum down time for Demand Resources); and 2) any block of hours the resource operates at PJM's direction in excess of the greater of its day-ahead schedule or minimum run time (minimum down time for Demand Resources). For each calendar day, and for each synchronized start of a generation resource or PJM-dispatched economic load reduction, there will be a maximum of two segments for each resource. Segment 1 will be the greater of the day-ahead schedule and minimum run time (minimum down time for Demand Resources) and Segment 2 will include the remainder of the contiguous hours when the resource is operating at the direction of the Office of the Interconnection, provided that a segment is limited to the Operating Day in which it commenced and cannot include any part of the following Operating Day.

Credits received pursuant to this section shall be equal to the positive difference between a resource's total offered price for start-up (shutdown costs for Demand Resources) and no-load fees and energy, determined on the basis of the resource's scheduled output, and the total value of the resource's energy as determined by the Real-time Energy Market and the real-time LMP(s) applicable to the relevant generation bus in the Real-time Energy Market. The foregoing notwithstanding, credits for segment 2 shall exclude start up (shutdown costs for Demand Resources) costs for generation resources.

Except as provided in Section 3.2.3(m), if the total offered price exceeds the total value, the difference less any credit as determined pursuant to Section 3.2.3(b) plus the resource's opportunity cost and less any amounts credited for Synchronized Reserve in excess of the Synchronized Reserve offer plus the resource's opportunity cost and less any amounts credited for Reactive Services as specified in Section 3.2.3.B, and less any amounts for Day-ahead Scheduling Reserve in excess of the Day-ahead Scheduling Reserve offer plus the resource's opportunity cost, shall be credited to the Market Seller.

Synchronized Reserve and Day-ahead Scheduling Reserve credits applied against Operating Reserve credits pursuant to this section shall be netted against the Operating Reserve credits earned in the corresponding hour(s) in which the Synchronized Reserve and Day-ahead Scheduling Reserve credits accrued, provided that for condensing combustion turbines, Synchronized Reserve credits will be netted against the total Operating Reserve credits accrued during each period the unit operates in condensing and generation mode for one or more contiguous hours.

(f) A Market Seller's steam-electric generating unit or combined cycle unit operating in combined cycle mode that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is reduced or suspended at the request of the Office of the Interconnection due to a transmission constraint or other reliability issue, and for which the hourly integrated, real-time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall be credited hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$, where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended, determined according to the real-time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(f-1) A Market Seller's combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool-scheduled (or self-scheduled, if operating according to Section

1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

(i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as directed by the PJM dispatcher), then the Market Seller shall be credited in a manner consistent with that described above for a steam unit or combined cycle unit operating in combined cycle mode.

(ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

URTLMP equals the real time LMP at the unit's bus;

UDALMP equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit, determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(f-2) A Market Seller's hydroelectric resource that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is altered at the request of the Office of the Interconnection from the schedule submitted by the owner, due to a transmission constraint or other reliability issue, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(f-3) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for opportunity cost associated with following PJM dispatch instructions and reducing or suspending a unit's output due to a transmission constraint or other reliability issue, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of opportunity cost compensation, the Office of the Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit

disagrees with the modified amount of opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(g) The sum of the foregoing credits, plus any cancellation fees paid in accordance with Section 1.10.2(d) such cancellation fees to be applied to the Operating Day for which the unit was scheduled, plus any shortfalls paid pursuant to the Market Settlement provision of the real-time Economic Load Response Program, less any payments received from another Control Area for Operating Reserves, plus any redispatch costs incurred in accordance with section 10(a) of this Schedule, shall be the cost of Operating Reserves for the Real-time Energy Market in each Operating Day.

(h) The cost of Operating Reserves for the Real-time Energy Market for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of the absolute values of its (i) load deviations (net of operating Behind The Meter Generation) from the Day-ahead Energy Market in megawatt-hours during that Operating Day, except as noted below and in the PJM Manuals; (ii) generation deviations (not including deviations in Behind The Meter Generation) from the Day-ahead Energy Market for non-dispatchable generation resources, including External Resources, in megawatt-hours during the Operating Day; (iii) deviations from the Day-ahead Energy Market for bilateral transactions from outside the PJM Region for delivery within such region in megawatt-hours during the Operating Day; and (iv) deviations of energy sales from the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such area pursuant to Section 1.12.

Deviations that occur within a single Zone shall be associated with the Eastern or Western Regions, as defined in Section 3.2.3(q) of this Schedule, and shall be subject to the regional balancing Operating Reserve rate determined in accordance with Section 3.2.3(q). Deviations at interfaces and hubs shall be associated with the Eastern or Western Region if all the busses that define all interfaces or all hubs are located in the region. If deviations at interfaces and hubs are associated with the Eastern or Western region, they shall be subject to the regional balancing Operating Reserve rate. Demand and supply deviations shall be based on total activity in a Zone, including all aggregates and hubs defined by busses that are wholly contained within the same Zone.

The foregoing notwithstanding, netting deviations shall be allowed in accordance with the following provisions:

(i) Generation resources with multiple units located at a single bus shall be able to offset deviations in accordance with the PJM Manuals to determine the net deviation MW at the relevant bus.

(ii) Demand deviations will be assessed by comparing all day-ahead demand transactions at a single transmission zone, hub, or interface against the real-time demand transactions at that same transmission zone, hub, or interface; except that the positive values of demand deviations, as set forth in the PJM Manuals, will not be assessed

Operating Reserve charges in the event of an Operating Reserve shortage in real-time or where PJM initiates the request for load reductions in real-time in order to avoid an Operating Reserve shortage as described in this Schedule, Section 6A, Scarcity Pricing.

(iii) Supply deviations will be assessed by comparing all day-ahead transactions at a single transmission zone, hub, or interface against the real-time transactions at that same transmission zone, hub, or interface.

(i) At the end of each Operating Day, Market Sellers shall be credited on the basis of their offered prices for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, as well as the credits calculated as specified in Section 3.2.3(b) for those generators committed solely for the purpose of providing synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, at the request of the Office of the Interconnection.

(j) The sum of the foregoing credits as specified in Section 3.2.3(i) shall be the cost of Operating Reserves for synchronous condensing for the PJM Region for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for the Operating Day and shall be separately determined for each Control Zone of the PJM Region based on the Control Zone to which the resource was synchronized to provide synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation.

(k) The cost of Operating Reserves for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of its (i) deliveries of energy to load (net of operating Behind The Meter Generation, but not to be less than zero) in the PJM Region, served under Network Transmission Service, in megawatt-hours during that Operating Day; and (ii) deliveries of energy sales from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such Control Zone pursuant to Section 1.12, as compared to the sum of all such deliveries for all Market Participants.

(l) For any Operating Day in either, as applicable, the Day-ahead Energy Market or the Real-time Energy Market for which, for all or any part of such Operating Day, the Office of the Interconnection: (i) declares a Maximum Generation Emergency; (ii) issues an alert that a Maximum Generation Emergency may be declared (“Maximum Generation Emergency Alert”); or (iii) schedules units based on the anticipation of a Maximum Generation Emergency or a Maximum Generation Emergency Alert, the Operating Reserves credit otherwise provided by Section 3.2.3.(b) or Section 3.2.3(e) in connection with market-based offers shall be limited as provided in subsections (n) or (m), respectively. The Office of the Interconnection shall provide timely notice on its internet site of the commencement and termination of any of the actions described in subsection (i), (ii), or (iii) of this subsection (l) (collectively referred to as “MaxGen Conditions”). Following the posting of notice of the commencement of a MaxGen Condition, a Market Seller may elect to submit a cost-based offer in accordance with Schedule 2 of the

Operating Agreement, in which case subsections (m) and (n) shall not apply to such offer; provided, however, that such offer must be submitted in accordance with the deadlines in Section 1.10 for the submission of offers in the Day-ahead Energy Market or Real-time Energy Market, as applicable. Submission of a cost-based offer under such conditions shall not be precluded by Section 1.9.7(b); provided, however, that the Market Seller must return to compliance with Section 1.9.7(b) when it submits its bid for the first Operating Day after termination of the MaxGen Condition.

(m) For the Real-time Energy Market, if the Effective Offer Price (as defined below) for a market-based offer is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. For purposes of this subsection (m), the Effective Offer Price shall be the amount that, absent subsections (l) and (m), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(e) plus the Real-time Energy Market revenues for the hours that the offer is economic divided by the megawatt hours of energy provided during the hours that the offer is economic. The hours that the offer is economic shall be: (i) the hours that the offer price for energy is less than or equal to the Real-time Price for the relevant generation bus, (ii) the hours in which the offer for energy is greater than Locational Marginal Price and the unit is operated at the direction of the Office of the Interconnection that are in addition to any hours required due to the minimum run time or other operating constraint of the unit, and (iii) for any unit with a minimum run time of one hour or less and with more than one start available per day, any hours the unit operated at the direction of the Office of the Interconnection.

(n) For the Day-ahead Energy Market, if notice of a MaxGen Condition is provided prior to 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. If notice of a MaxGen Condition is provided after 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. If the Effective Offer Price is less than or equal to \$1,000/MWh, regardless of when notice of a MaxGen Condition is provided, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. For purposes of this subsection (n), the Effective Offer Price shall be the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day divided by the megawatt hours of energy offered during the Specified Hours, plus the offer for energy during such hours. The Specified Hours shall be the lesser of: (1) the minimum run hours stated by the Market Seller in its Offer Data; and (2) either (i) for steam-electric generating units and for combined-cycle units when such units are operating in combined-cycle mode, the six consecutive hours of highest Day-ahead Price during such Operating Day when such units are running or (ii) for combustion turbine units and for combined-cycle units when such units are operating in combustion turbine mode, the two consecutive hours of highest Day-ahead Price during such Operating Day when such units are running. Notwithstanding any other provision in this subsection, the total compensation to a Market Seller on any Operating Day that includes a MaxGen Condition shall not exceed \$1,000/MWh during the Specified Hours, where such total compensation in each such hour is

defined as the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(b) divided by the Specified Hours, plus the Day-ahead Price for such hour, and no Operating Reserves payments shall be made for any other hour of such Operating Day. If a unit operates in real time at the direction of the Office of the Interconnection consistently with its day-ahead clearing, then subsection (m) does not apply.

(o) Dispatchable pool-scheduled generation resources and dispatchable self-scheduled generation resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Pool-scheduled generation resources and dispatchable self-scheduled generation resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations in accordance with the calculations described in the PJM Manuals. Ramp-limited desired MW values shall be used to determine generation resource real-time deviations from the resource's day-ahead schedules.

The Office of the Interconnection shall calculate a ramp-limited desired MW value for generation resources where the economic minimum and economic maximum are at least as far apart in real-time as they are in day-ahead according to the following parameters:

(i) real-time economic minimum $\leq$ 105% of day-ahead economic minimum or day-ahead economic minimum plus 5 MW, whichever is greater.

(ii) real-time economic maximum $\geq$ 95% day-ahead economic maximum or day-ahead economic maximum minus 5 MW, whichever is lower.

The ramp-limited desired MW value for a generation resource shall be equal to:

$$\text{Ramp\_Request}_t = \frac{(\text{UDStarget}_{t-1} - \text{AOutput}_{t-1})}{(\text{UDSLAtime}_{t-1})}$$

$$\text{RL\_Desired}_t = \text{AOutput}_{t-1} + \left(\text{Ramp\_Request}_t * \text{Case\_Eff\_time}_{t-1} \right)$$

where:

1. UDStarget = UDS basepoint for the previous UDS case
2. AOutput = Unit's output at case solution time
3. UDSLAtime = UDS look ahead time
4. Case_Eff_time = Time between base point changes
5. RL_Desired = Ramp-limited desired MW

To determine if a generation resource is following dispatch the Office of the Interconnection shall determine the unit's MW off dispatch and % off dispatch by using the lesser of the difference between the actual output and the UDS Basepoint or the actual output and ramp-limited desired MW value. The % off dispatch and MW off dispatch will be a time-weighted average over the course of an hour.

A pool-scheduled or dispatchable self-scheduled resource is considered to be following dispatch if its actual output is between its ramp-limited desired MW value and UDS Basepoint, or if its % off dispatch is ≤ 10 , or its hourly integrated Real-time MWh is within 5% or 5 MW (whichever is greater) of the hourly integrated ramp-limited desired MW. A self-scheduled generator must also be dispatched above economic minimum. The degree of deviations for resources that are not following dispatch shall be determined in accordance with the following provisions:

- A dispatchable self-scheduled resource that is not dispatched above economic minimum shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – Day-Ahead MWh.
- A resource that is dispatchable day-ahead but is Fixed Gen in real-time shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – UDS LMP Desired MW.
- Pool-scheduled generators that are not following dispatch shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW.
- If a resource's real-time economic minimum is greater than its day-ahead economic minimum by 5% or 5 MW, whichever is greater, or its real-time economic maximum is less than its Day Ahead economic maximum by 5% or 5 MW, whichever is lower, and UDS LMP Desired MWh for the hour is either below the real time economic minimum or above the real time economic maximum, then balancing Operating Reserve deviations for the resource shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch and its % Off Dispatch is $\leq 20\%$, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW. If deviation value is within 5% or 5 MW (whichever is greater) of Ramp-Limited Desired MW, balancing Operating Reserve deviations shall not be assessed.
- If a resource is not following dispatch and its % off Dispatch is $> 20\%$, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch, and the resource has tripped, for the hour the resource tripped and the hours it remains offline throughout its day-ahead schedule balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – Day-Ahead MWh.

- For resources that are not dispatchable in both the Day-Ahead and Real-time Energy Markets balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh and Day-Ahead MWh.

(o-1) Dispatchable economic load reduction resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Economic load reduction resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations as described in this subsection and as further specified in the PJM Manuals.

The Desired MW quantity for such resources for each hour shall be the hourly integrated MW quantity to which the load reduction resource was dispatched for each hour (where the hourly integrated value is the average of the dispatched values as determined by the Office of the Interconnection for the resource for each hour).

If the actual reduction quantity for the load reduction resource for a given hour deviates by no more than 20% above or below the Desired MW quantity, then no balancing Operating Reserve deviation will accrue for that hour. If the actual reduction quantity for the load reduction resource for a given hour is outside the 20% bandwidth, the balancing Operating Reserve deviations will accrue for that hour in the amount of the absolute value of (Desired MW – actual reduction quantity). For those hours where the actual reduction quantity is within the 20% bandwidth specified above, the load reduction resource will be eligible to be made whole for the total value of its offer as defined in section 3.3A of this Appendix. Hours for which the actual reduction quantity is outside the 20% bandwidth will not be eligible for the make-whole payment. If at least one hour is not eligible for make-whole payment based on the 20% criteria, then the resource will also not be made whole for its shutdown cost.

(p) The Office of the Interconnection shall allocate the charges assessed pursuant to Section 3.2.3(h) of Schedule 1 of this Agreement to real-time deviations from day-ahead schedules or real-time load share plus exports depending on whether the underlying balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

(i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve charges shall be allocated based on the reason the resource was scheduled according to the following provisions:

(A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve charges shall be allocated to real-time deviations from day-ahead schedules.

(B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to

maintain system reliability, the associated balancing Operating Reserve charges shall be allocated according to ratio share of real time load plus export transactions.

(C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated pursuant to (A) or (B) above.

(ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to the following provisions:

(A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, charges will be assessed pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the charges for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(h)(ii)(A) of Schedule 1 of this Agreement to operate in real-time during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to real-time deviations from day-ahead schedules.

(q) The Office of the Interconnection shall determine regional balancing Operating Reserve rates for the Western and Eastern Regions of the PJM Region. For the purposes of this section, the Western Region shall be the AEP, APS, ComEd, Duquesne, Dayton ATSI transmission Zones, and the Eastern Region shall be the AEC, BGE, Dominion, PENELEC, PEPCO, ME, PPL, JCPL, PECO, DPL, PSEG, RE transmission Zones. The regional balancing Operating Reserve rates shall be determined in accordance with the following provisions:

(i) The Office of the Interconnection shall calculate regional adder rates for the Eastern and Western Regions. Regional adder rates shall be equal to the total balancing Operating Reserve credits paid to generators for transmission constraints that occur on transmission system capacity equal to or less than 345kv. The regional adder rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are

designated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(ii) The Office of the Interconnection shall calculate RTO balancing Operating Reserve rates. RTO balancing Operating Reserve rates shall be equal to balancing Operating Reserve credits in excess of the regional adder rates calculated pursuant to Section 3.2.3(q)(i) of Schedule 1 of this Agreement. The RTO balancing Operating Reserve rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are allocated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(iii) Reliability and deviation regional balancing Operating Reserve rates shall be determined by summing the relevant RTO balancing Operating Reserve rates and regional adder rates.

(iv) If the Eastern and/or Western Regions do not have regional adder rates, the relevant regional balancing Operating Reserve rate shall be the reliability and/or deviation RTO balancing Operating Reserve rate.

3.2.3A Synchronized Reserve.

(a) Each Internal Market Buyer that is a Load Serving Entity shall have an obligation for hourly Synchronized Reserve equal to its pro rata share of Synchronized Reserve requirements for the hour for each Synchronized Reserve Zone of the PJM Region, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Synchronized Reserve Zone for the hour ("Synchronized Reserve Obligation"), less any amount obtained from condensers associated with provision of Reactive Services as described in section 3.2.3B(i) and any amount obtained from condensers associated with post-contingency operations, as described in section 3.2.3C(b). An Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation shall be charged for the Synchronized Reserve dispatched by the Office of the Interconnection to meet such obligation at the Synchronized Reserve Market Clearing Price determined in accordance with subsection (d) of this section, plus the amounts if any, described in subsections (g), (h) and (i) of this section.

(b) A Generating Market Buyer supplying Synchronized Reserve at the direction of the Office of the Interconnection, in excess of its hourly Synchronized Reserve Obligation, shall be credited as follows:

i) Credits for Synchronized Reserve provided by generation units that are then subject to the energy dispatch signals and instructions of the Office of the Interconnection and that increase their current output or Demand Resources that reduce their load in response to a Synchronized Reserve Event ("Tier 1 Synchronized Reserve") shall be at the Synchronized Energy Premium Price.

ii) Credits for Synchronized Reserve provided by generation resources that are synchronized to the grid but, at the direction of the Office of the Interconnection, are operating at a point that deviates from the Office of the Interconnection energy dispatch signals and instructions (“Tier 2 Synchronized Reserve”) shall be the higher of (i) the Synchronized Reserve Market Clearing Price or (ii) the sum of (A) the Synchronized Reserve offer, and (B) the specific opportunity cost of the generation resource supplying the increment of Synchronized Reserve, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

iii) Credits for Synchronized Reserve provided by Demand Resources that are synchronized to the grid and accept the obligation to reduce load in response to a synchronized Reserve Event initiated by the Office of the Interconnection shall be the sum of (i) the higher of (A) the Synchronized Reserve offer or (B) the synchronized Reserve Market Clearing Price and (ii) if a Synchronized Reserve Event is actually initiated by the Office of the Interconnection and the Demand Resource reduced its load in response to the event, the fixed costs associated with achieving the load reduction, as specified in the PJM Manuals.

(c) The Synchronized Reserve Energy Premium Price is the average of the five-minute Locational Marginal Prices calculated during the Synchronized Reserve Event plus an adder in an amount to be determined periodically by the Office of the Interconnection not less than fifty dollars and not to exceed one hundred dollars per megawatt hour.

(d) The Synchronized Reserve Market Clearing Price shall be determined for each Synchronized Reserve Zone by the Office of the Interconnection prior to the operating hour and such market-clearing price shall be equal to, from among the generation resources or Demand Resources selected to provide Synchronized Reserve for such Synchronized Reserve Zone, the highest sum of either (i) a generation resource’s Synchronized Reserve offer and opportunity cost or (ii) a demand response resource’s Synchronized Reserve offer.

(e) In determining the Synchronized Reserve Market Clearing Price, the estimated unit-specific opportunity cost for a generation resource shall be equal to the sum of (i) the product of (A) the expected Locational Marginal Price at the generation bus for the generation resource times (B) the megawatts of energy used to provide Synchronized Reserve submitted as part of the Synchronized Reserve offer and (ii) the product of (A) the deviation of the set point of the generation resource that is expected to be required in order to provide Synchronized Reserve from the generation resource’s expected output level if it had been dispatched in economic merit order times (B) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(f) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Tier 2 Synchronized Reserve and that actively follows the Office of the Interconnection’s signals and instructions, the unit-specific opportunity cost of a generation

resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Tier 2 Synchronized Reserve and shall be equal to the sum of (i) the product of (A) the megawatts of energy used by the resource to provide Synchronized Reserve as submitted as part of the generation resource's Synchronized Reserve offer times (B) the Locational Marginal Price at the generation bus of the generation resource, and (ii) the product of (A) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's signals and instructions from the generation resource's expected output level if it had been dispatched in economic merit order, times (B) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the generation resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(g) Charges for Tier 1 Synchronized Reserve will be allocated in proportion to the amount of Tier 1 Synchronized Reserve applied to each Synchronized Reserve Obligation. In the event Tier 1 Synchronized Reserve is provided by a Market Seller in excess of that Market Seller's Synchronized Reserve Obligation, the remainder of the Tier 1 Synchronized Reserve that is not utilized to fulfill the Seller's obligation will be allocated proportionately among all other Synchronized Reserve Obligations.

(h) Any amounts credited for Tier 2 Synchronized Reserve in an hour in excess of the Synchronized Reserve Market Clearing Price in that hour shall be allocated and charged to each Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation in proportion to its purchases of Synchronized Reserve in megawatt-hours during that hour.

(i) In the event the Office of the Interconnection needs to assign more Tier 2 Synchronized Reserve during an hour than was estimated as needed at the time the Synchronized Reserve Market Clearing Price was calculated for that hour due to a reduction in available Tier 1 Synchronized Reserve, the costs of the excess Tier 2 Synchronized Reserve shall be allocated and charged to those providers of Tier 1 Synchronized Reserve whose available Tier 1 Synchronized Reserve was reduced from the needed amount estimated during the Synchronized Reserve Market Clearing Price calculation, in proportion to the amount of the reduction in Tier 1 Synchronized Reserve availability.

(j) In the event a generation resource or Demand Resource that either has been assigned by the Office of the Interconnection or self-scheduled by the owner to provide Tier 2 Synchronized Reserve fails to provide the assigned or self-scheduled amount of Synchronized Reserve in response to an actual Synchronized Reserve Event, the owner of the resource shall incur an additional Synchronized Reserve Obligation in the amount of the shortfall for a period of three consecutive days with the same peak classification (on-peak or off-peak) as the day of the Synchronized Reserve Event at least three business days following the Synchronized Reserve Event. The overall Synchronized Reserve requirement for each Synchronized Reserve Zone of the PJM Region on which the Synchronized Reserve Obligations, except for the additional obligations set forth in this section, are based shall be reduced by the amount of this shortfall for the applicable three-day period.

(k) The magnitude of response to a Synchronized Reserve Event by a generation resource or a Demand Resource, except for Batch Load Demand Resources covered by section 3.2.3A(l) is the difference between the generation resource's output or the Demand Resource's consumption at the start of the event and its output or consumption 10 minutes after the start of the event. In order to allow for small fluctuations and possible telemetry delays, generation resource output or Demand Resource consumption at the start of the event is defined as the lowest telemetered generator resource output or greatest Demand Resource consumption between one minute prior to and one minute following the start of the event. Similarly, a generation resource's output or a Demand Resource's consumption 10 minutes after the event is defined as the greatest generator resource output or lowest Demand Resource consumption achieved between 9 and 11 minutes after the start of the event. The response actually credited to a generation resource will be reduced by the amount the megawatt output of the generation resource falls below the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter. The response actually credited to a Demand Resource will be reduced by the amount the megawatt consumption of the Demand Resource exceeds the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter.

(l) The magnitude of response by a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the start of a Synchronized Reserve Event shall be the difference between (i) the Batch Load Demand Resource's consumption at the end of the Synchronized Reserve Event and (ii) the Batch Load Demand Resource's consumption during the minute within the ten minutes after the end of the Synchronized Reserve Event in which the Batch Load Demand Resource's consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the magnitude of the response shall be zero if, when the Synchronized Reserve Event commences, the scheduled off-cycle stage of the production cycle is greater than ten minutes.

3.2.3A.01 Day-ahead Scheduling Reserves.

(a) The Office of the Interconnection shall satisfy the Day-ahead Scheduling Reserves Requirement by procuring Day-ahead Scheduling Reserves in the Day-ahead Scheduling Reserves Market from Day-ahead Scheduling Reserves Resources, provided that Demand Resources shall be limited to providing the lesser of any limit established by the Reliability First Corporation or SERC, as applicable, or twenty-five percent of the total Day-ahead Scheduling Reserves Requirement. Day-ahead Scheduling Reserves Resources that clear in the Day-ahead Scheduling Reserves Market shall receive a Day-ahead Scheduling Reserves schedule from the Office of the Interconnection for the relevant Operating Day. PJMSettlement shall be the Counterparty to the purchases and sales of Day-ahead Scheduling Reserves in the PJM Interchange Energy Market; provided that PJMSettlement shall not be a contracting party to bilateral transactions between Market Participants or with respect to a self-schedule or self-supply of generation resources by a Market Buyer to satisfy its Day-ahead Scheduling Reserves Requirement.

(b) A Day-ahead Scheduling Reserves Resource that receives a Day-ahead Scheduling Reserves schedule pursuant to subsection (a) of this section shall be paid the hourly Day-ahead Scheduling Reserves Market clearing price for the MW obligation in each hour of the schedule, subject to meeting the requirements of subsection (c) of this section.

(c) To be eligible for payment pursuant to subsection (b) of this section, Day-ahead Scheduling Reserves Resources shall comply with the following provisions:

(i) Generation resources with a start time greater than thirty minutes are required to be synchronized and operating at the direction of the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule and shall have a dispatchable range equal to or greater than the Day-ahead Scheduling Reserves schedule.

(ii) Generation resources and Demand Resources with start times or shut-down times, respectively, equal to or less than 30 minutes are required to respond to dispatch directives from the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule. To meet this requirement the resource shall be required to start or shut down within the specified notification time plus its start or shut down time, provided that such time shall be less than thirty minutes.

(iii) Demand Resources with a Day-ahead Scheduling Reserves schedule shall be credited based on the difference between the resource's MW consumption at the time the resource is directed by the Office of the Interconnection to reduce its load (starting MW usage) and the resource's MW consumption at the time when the Demand Resource is no longer dispatched by PJM (ending MW usage). For the purposes of this subsection, a resource's starting MW usage shall be the greatest telemetered consumption between one minute prior to and one minute following the issuance of a dispatch instruction from the Office of the Interconnection, and a resource's ending MW usage shall be the lowest consumption between one minute before and one minute after a dispatch instruction from the Office of the Interconnection that is no longer necessary to reduce.

(iv) Notwithstanding subsection (iii) above, the credit for a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the time the resource is directed by the Office of the Interconnection to reduce its load shall be the difference between (i) the "ending MW usage" (as defined above) and (ii) the Batch Load Demand Resource's consumption during the minute within the ten minutes after the time of the "ending MW usage" in which the Batch Load Demand Resource's consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the credit shall be zero if, at the time the resource is directed by the Office of the Interconnection to reduce its load, the scheduled off-cycle stage of the production cycle is greater than the timeframe for which the resource was dispatched by PJM.

Resources that do not comply with the provisions of this subsection (c) shall not be eligible to receive credits pursuant to subsection (b) of this section.

(d) The cost of credits allocated to Day-ahead Scheduling Reserves Resources pursuant to this section shall be charged to Load-Serving Entities in the PJM Region based on load ratio share (net of operating Behind The Meter Generation, but not to be less than zero), provided that a Load-Serving Entity may satisfy its Day-ahead Scheduling Reserves obligation, which is equal to the Day-ahead Scheduling Reserves Requirement multiplied by the Load-Serving Entity's load ratio share for the PJM Region, through one or any combination of the following: 1) the Day-ahead Scheduling Reserves Market; 2) and bilateral arrangements. The Day-ahead Scheduling Reserve charges allocated pursuant to this section shall reflect any portion of a Load-Serving Entity's Day-ahead Scheduling Reserves obligation that is met by bilateral arrangement(s).

(e) If the Day-ahead Scheduling Reserves Requirement is not satisfied through the operation of subsection (a) of this section, any additional Operating Reserves required to meet the requirement shall be scheduled by the Office of the Interconnection pursuant to Section 3.2.3 of Schedule 1 of this Agreement.

3.2.3B Reactive Services.

(a) A Market Seller providing Reactive Services at the direction of the Office of the Interconnection shall be credited as specified below for the operation of its resource. These provisions are intended to provide payments to generating units when the LMP dispatch algorithms would not result in the dispatch needed for the required reactive service. LMP will be used to compensate generators that are subject to redispatch for reactive transfer limits.

(b) At the end of each Operating Day, where the active energy output of a Market Seller's resource is reduced or suspended at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region, the Market Seller shall be credited according to Sections 3.2.3B(c) & 3.2.3B(d).

(c) A Market Seller providing Reactive Services from either a steam-electric generating unit or combined cycle unit operating in combined cycle mode, where such unit is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override) shall be compensated for lost opportunity cost by receiving a credit hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URLMP - UB)\}$

where:

LMPDMW equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended determined according to the real time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URLMP - UB$ shall not be negative.

(d) A Market Seller providing Reactive Services from either a combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

(i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection as directed by the PJM dispatcher, then the Market Seller shall be credited in a manner consistent with that described above in Section 3.2.3B(c) for a steam unit or a combined cycle unit operating in combined cycle mode.

(ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URLMP - UDALMP) \times DAG\}$, or (ii) $\{(URLMP - UB) \times DAG\}$ where:

URLMP equals the real time LMP at the unit's bus;

UDALMP equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(e) At the end of each Operating Day, where the active energy output of a Market Seller's unit is increased at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region and the offered price of the energy is above the real-time LMP at the unit's bus, the Market Seller shall be credited according to Section 3.2.3B(f).

(f) A Market Seller providing Reactive Services from either a steam-electric generating unit, combined cycle unit or combustion turbine unit, where such unit is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is lower than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall receive a credit hourly in an amount equal to $\{(AG - LMP_{DMW}) \times (UB - URTLMP)\}$ where:

AG equals the actual hourly integrated output of the unit;

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

UB equals the unit offer for that unit for which output is increased, determined according to the real time scheduled offer curve on which the unit was operating;

URTLMP equals the real time LMP at the unit's bus; and

where $UB - URTLMP$ shall not be negative.

(g) A Market Seller providing Reactive Services from a hydroelectric resource where such resource is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the output of such resource is altered from the schedule submitted by the Market Seller for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(h) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for lost opportunity cost associated with following the Office of the Interconnection's dispatch instructions to reduce or suspend a unit's output for the purpose of maintaining reactive reliability, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of such alternate lost opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such

discussion, if the Office of the Interconnection accepts a modified amount of alternate lost opportunity cost compensation, the Office of the Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit disagrees with the modified amount of alternate lost opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(i) The amount of Synchronized Reserve provided by generating units maintaining reactive reliability shall be counted as Synchronized Reserve satisfying the overall PJM Synchronized Reserve requirements. Operators of these generating units shall be notified of such provision, and to the extent a generating unit's operator indicates that the generating unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated to provide Reactive Services also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generating unit provided synchronous condensing multiplied by the amount of Synchronized reserve provided by the synchronous condenser or (ii) the sum of (A) the generating unit's hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of MW energy usage for providing synchronous condensing multiplied by the real time LMP at the generating unit's bus, (C) the generating unit's startup-cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generating resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated to provide Reactive Services was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generating unit's cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to paragraph (l) below.

(j) A Market Seller's pool scheduled steam-electric generating unit or combined cycle unit operating in combined cycle mode, that is not committed to operate in the Day-ahead Market, but that is directed by the Office of Interconnection to operate solely for the purpose of maintaining reactive reliability, at the request of the Office of the Interconnection, shall be credited in the amount of the unit's offered price for start-up and no-load fees. The unit also shall receive, if applicable, compensation in accordance with Sections 3.2.3B(e)-(f).

(k) The sum of the foregoing credits as specified in Sections 3.2.3B(b)-(j) shall be the cost of Reactive Services for the purpose of maintaining reactive reliability for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched for the purpose of maintaining reactive reliability in such transmission zone.

(l) The cost of Reactive Services for the purpose of maintaining reactive reliability in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

(m) Generating units receiving dispatch instructions from the Office of the Interconnection under the expectation of increased actual or reserve reactive shall inform the Office of the Interconnection dispatcher if the requested reactive capability is not achievable. Should the operator of a unit receiving such instructions realize at any time during which said instruction is effective that the unit is not, or likely would not be able to, provide the requested amount of reactive support, the operator shall as soon as practicable inform the Office of the Interconnection dispatcher of the unit's inability, or expected inability, to provide the required reactive support, so that the associated dispatch instruction may be cancelled. PJM Performance Compliance personnel will audit operations after-the-fact to determine whether a unit that has altered its active power output at the request of the Office of the Interconnection has provided the actual reactive support or the reactive reserve capability requested by the Office of the Interconnection. PJM shall utilize data including, but not limited to, historical reactive performance and stated reactive capability curves in order to make this determination, and may withhold such compensation as described above if reactive support as requested by the Office of the Interconnection was not or could not have been provided.

3.2.3C Synchronous Condensing for Post-Contingency Operation.

(a) Under normal circumstances, PJM operates generation out of merit order to control contingency overloads when the flow on the monitored element for loss of the contingent element ("contingency flow") exceeds the long-term emergency rating for that facility, typically a 4-hour or 2-hour rating. At times however, and under certain, specific system conditions, PJM does not operate generation out of merit order for certain contingency overloads until the contingency flow on the monitored element exceeds the 30-minute rating for that facility ("post-contingency operation"). In conjunction with such operation, when the contingency flow on such element exceeds the long-term emergency rating, PJM operates synchronous condensers in the areas affected by such constraints, to the extent they are available, to provide greater certainty that such resources will be capable of producing energy in sufficient time to reduce the flow on the monitored element below the normal rating should such contingency occur.

(b) The amount of Synchronized Reserve provided by synchronous condensers associated with post-contingency operation shall be counted as Synchronized Reserve satisfying the PJM Synchronized Reserve requirements. Operators of these generation units shall be notified of such provision, and to the extent a generation unit's operator indicates that the generation unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated in conjunction with post-contingency operation also provided Synchronized Reserve, a Market Seller shall be credited for

providing synchronous condensing in conjunction with post-contingency operation at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generation resource provided synchronous condensing multiplied by the amount of Synchronized Reserve provided by the synchronous condenser or (ii) the sum of (A) the generation resource's hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of the megawatts of energy used to provide synchronous condensing multiplied by the real-time LMP at the generation bus of the generation resource, (C) the generation resource's start-up cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generation resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated in association with post-contingency constraint control was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generation unit's cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to section (d) below.

(c) The sum of the foregoing credits as specified in section 3.2.3C(b) shall be the cost of synchronous condensers associated with post-contingency operations for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched in association with post-contingency operation in such transmission zone.

(d) The cost of synchronous condensers associated with post-contingency operations in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

3.2.4 Transmission Congestion Charges.

Each Market Buyer shall be assessed Transmission Congestion Charges as specified in Section 5 of this Schedule.

3.2.5 Transmission Loss Charges.

Each Market Buyer shall be assessed Transmission Loss Charges as specified in Section 5 of this Schedule.

3.2.6 Emergency Energy.

(a) Market Participants shall be allocated a proportionate share of the net cost of Emergency energy purchased by the Office of the Interconnection. Such allocated share during each hour of such Emergency energy purchase shall be in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales. This deviation shall not include any reduction or suspension of output of pool scheduled resources requested by PJM to manage an Emergency within the PJM Region.

(b) Net revenues in excess of Real-time Prices attributable to sales of energy in connection with Emergencies to other Control Areas shall be credited to Market Participants during each hour of such Emergency energy sale in proportion to the sum of (i) each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales, and (ii) each Market Participant's energy sales from within the PJM Region to entities outside the PJM Region that have been curtailed by PJM.

(c) The net costs or net revenues associated with sales or purchases of hourly energy in connection with a Minimum Generation Emergency in the PJM Region, or in another Control Area, shall be allocated during each hour of such Emergency sale or purchase to each Market Participant in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Market, whenever that deviation increases the Market Participant's spot market sales or decreases its spot market purchases.

3.2.7 Billing.

(a) PJMSettlement shall prepare a billing statement each billing cycle for each Market Buyer in accordance with the charges and credits specified in Sections 3.2.1 through 3.2.6 of this Schedule, and showing the net amount to be paid or received by the Market Buyer. Billing statements shall provide sufficient detail, as specified in the PJM Manuals, to allow verification of the billing amounts and completion of the Market Buyer's internal accounting.

(b) If deliveries to a Market Buyer that has PJM Interchange meters in accordance with Section 14 of the Operating Agreement include amounts delivered for a Market Participant that does not have PJM Interchange meters separate from those of the metered Market Buyer, PJMSettlement shall prepare a separate billing statement for the unmetered Market Participant based on the allocation of deliveries agreed upon between the Market Buyer and the unmetered Market Participant specified by them to the Office of the Interconnection.

3.3A Economic Load Response Participants.

3.3A.1 Compensation.

Economic Load Response Participants shall be compensated pursuant to Sections 3.3A.4~~5~~ and/or 3.3A.5~~6~~ of this Schedule, for demand reduction offers submitted in the Day-Ahead Energy Market or Real-time Energy Market that satisfy the Net Benefits Test of section 3.3A.4; that are scheduled by the Office of the Interconnection; and that follow the dispatch instructions of the Office of the Interconnection. Qualifying demand reductions shall be measured by: 1) comparing actual metered load to an end-use customer's Customer Baseline Load or alternative CBL determined in accordance with the provisions of Section 3.3A.2 or 3.3A.2.01, respectively; or 2) by the MWs produced by on-Site Generators pursuant to the provisions of Section 3.3A.2.02.

3.3A.2 Customer Baseline Load.

For Economic Load Response Participants that choose to measure demand reductions using an end-use customer's Customer Baseline Load ("CBL"), the CBL shall be determined using the following formula for such participant's Non-Variable Loads:

(a) The CBL for weekdays shall be the average of the highest 4 out of the 5 most recent ~~highest~~ load weekdays in the 45 calendar day period preceding the relevant load reduction event.

i. For the purposes of calculating the CBL for weekdays, weekdays shall not include:

1. NERC holidays;
2. Weekend days;
3. Event days. For the purposes of this section an event day shall be any weekday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.4 or 3.3A.5, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
4. Any weekday where the average daily event period usage is less than 25% of the average event period usage for the five days.

ii. ~~For the purposes of calculating the CBL for weekdays, the 45-day period shall be extended one day for each of the following days that occur within the relevant period, provided that extensions pursuant to this section shall not exceed 15 days (i.e. 60 days total including the relevant 45-day period):~~

- ~~1. NERC holidays;~~
- ~~2. Event day(s), as defined in subsection (a)(i)(3) above, in which the hourly LMP exceeds the annual threshold in at least 4 hours, where the annual threshold will be effective from June 1 through May 31 and will be determined based on the load weighted average PJM real time LMP for the 99th percentile for the calendar year prior to May 31;~~
- ~~3. Weekdays the relevant end-use customer site responds to the dispatch instructions of the Office of the Interconnection;~~
- ~~4. Any weekday the event period usage is less than 25% of the average event period usage for the five days.~~

~~iii.~~ If a 45-day period does not include 5 weekdays that meet the conditions in subsection (a)(i) of this section, provided there are 4 weekdays that meet the conditions in subsection (a)(i) of this section, the CBL shall be based on the average of those 4 weekdays. If there are not 4 eligible weekdays, the CBL shall be determined in accordance with subsection ~~(iii)~~ of this section.

~~iiiv.~~ Section 3.3A.2(a)(i)(3) notwithstanding, if a 45-day period does not include 4 weekdays that meet the conditions in subsection (a)(i) of this section, event days will be used as necessary to meet the 4 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(b) The CBL for weekend days and NERC holidays shall be determined in accordance with the following provisions:

i. The CBL for Saturdays and Sundays/NERC holidays shall be the average of the highest 2 load days out of the 3 most recent Saturdays or Sundays/NERC holidays, respectively, in the 45 calendar day period preceding the relevant load reduction event, provided that the following days shall not be used to calculate a Saturday or Sunday/NERC holiday CBL:

1. Event days. For the purposes of this section an event day shall be any Saturday and Sunday/NERC holiday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.~~45~~ or 3.3A.~~56~~, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
2. Any Saturday or Sunday/NERC holiday where the average daily event period usage is less than 25% of the average event period usage level for the three days;
3. Any Saturday or Sunday/NERC holiday that corresponds to the beginning or end of daylight savings.

ii. ~~For the purposes of calculating the CBL for Saturdays or Sundays/NERC holidays, the 45-day period shall be extended one day for each of the following days that occur within the relevant period, provided that extensions pursuant to this section shall not exceed 15 days (i.e. 60 days total including the relevant 45-day period):~~

- ~~1. Event day(s), as defined in subsection (b)(i)(1) above, in which the hourly LMP exceeds the annual threshold in at least 4 hours, where the annual threshold will be effective from June 1 through May 31 and will be determined based on the load-weighted average PJM real-time LMP for the 99th percentile for the calendar year prior to May 31;~~
- ~~2. Saturday or Sundays/NERC holidays where the relevant end-use customer site responds to the dispatch instructions of the Office of the Interconnection.~~

~~iii.~~ If a 45-day period does not include 3 Saturdays or 3 Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, provided there are 2 Saturdays or Sundays/NERC holidays that meet the conditions in subsection (b)(i) of this section, the CBL will be based on the average of those 2 Saturdays or Sundays/NERC holidays. If there are not 2 eligible Saturdays or Sundays/NERC holidays, the CBL shall be determined in accordance with subsection (iiv) of this section.

~~iiv.~~ Section 3.3A.2(b)(i)(1) notwithstanding, if a 45-day period does not include 2 Saturdays or Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, event days will be used as necessary to meet the 2 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(c) CBLs established pursuant to this section shall represent end-use customers' actual load patterns. If the Office of the Interconnection determines that a CBL or alternative CBL does not accurately represent a customer's actual load patterns, the CBL shall be revised accordingly pursuant to Section 3.3A.2.01. Consistent with this requirement, if an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer upon whose behalf it is acting that would result in the adjustment of more than half the hours in the affected party's Customer Baseline Load by twenty percent or more for more than twenty days.

3.3A.2.01 Alternative Customer Baseline Methodologies.

(a) During the Economic Load Response Participant registration process pursuant to Section 1.5A.3 of this Schedule, the relevant Economic Load Response Participant, ~~Load Serving Entity, electric distribution company, and/~~ or the Office of the Interconnection ("Interested Parties") may, in the case of such participant's Non-Variable Load customers, and shall, in the case of its Variable Load customers, propose an alternative CBL calculation that

more accurately reflects the relevant end-use customer's consumption pattern relative to the CBL determined pursuant to Section 3.3A.2. In support of such proposal, the participant shall demonstrate that the alternative CBL method shall result in an hourly relative root mean square error of twenty percent or less compared to actual hourly values, as calculated in accordance with the technique specified in the PJM Manuals. Any proposal made pursuant to this section shall be provided to ~~all the~~ other Interested ~~Parties~~Party.

(b) The Interested Parties shall have 30 days to agree on a proposal issued pursuant to subsection (a) of this section. The 30-day period shall start the day the proposal is ~~received by~~ all provided to the other Interested ~~Parties~~Party. If ~~all both~~ Interested Parties agree on a proposal issued pursuant to this section, that alternative CBL calculation methodology shall be effective consistent with the date of the relevant Economic Load Response Participant registration.

(c) If agreement is not reached pursuant to subsection (b) of this section, the Office of the Interconnection shall determine a CBL methodology within 20 days from the expiration of the 30-day period established by subsection (b). A CBL established by the Office of the Interconnection pursuant to this subsection (c) shall be binding upon ~~all both~~ Interested Parties unless the Interested Parties reach agreement on an alternative CBL methodology prior to the expiration of the 20-day period established by this subsection (c).

(d) Operation of this Section 3.3A.2.01 shall not delay Economic Load Response Participant registrations pursuant to Section 1.5A.3, provided that the alternative CBL established pursuant to this section shall be used for all related energy settlements made pursuant to Sections 3.3A.4 and 3.3A.5.

(e) The Office of the Interconnection shall periodically publish alternative CBL methodologies established pursuant to this section in the PJM Manuals.

3.3A.2.02 On-Site Generators.

On-Site Generators used as the basis for Economic Load Response Participant status pursuant to Section 1.5A shall be subject to the following provisions:

i. The On-Site Generator shall be used solely to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market and shall not otherwise have been operating;

ii. If subsection (i) does not apply, the amount of energy from an On-Site Generator used to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market shall be capable of being quantified in a manner that is acceptable to the Office of the Interconnection.

3.3A.3 ~~Weather-Sensitive and~~ Symmetric Additive Adjustment.

(a) Customer Baseline Levels established pursuant to section 3.3A.2 shall be adjusted by the Concurrent with submitting a Economic Load Response Registration Form to the Office of the Interconnection and annually thereafter, the Economic Load Response Participant shall notify the Office of the Interconnection whether it elects to apply the Weather Sensitive Adjustment (or “WSA”) or Symmetric Additive Adjustment for the summer period (May–October) or the winter period (November–April). The Weather Sensitive Adjustment either will decrease or increase Customer Baseline Load values. The Weather Sensitive Adjustment may apply to measure load reductions in both the Real-time Energy Market and Day-ahead Energy Market, except that the simplified analysis for the summer period cannot be used with regard to the Day-ahead Energy Market. Unless an alternative formula is approved by the Office of the Interconnection and agreed upon by all relevant parties, including any Curtailment Service Provider, Load Serving Entity and end-use customer, the Weather Sensitive Adjustment and Symmetric Additive Adjustment shall be calculated using the following applicable formula:

~~Regression Analysis (available for the summer and winter period.)~~

~~Step 1: Perform a regression analysis in Excel using the slope & intercept functions between the end-use customer’s on-peak (8 AM to 8 PM), non-holiday, weekday hourly loads and the temperature-humidity index (“THI”) on a seasonal basis for the period the WSA is being applied.~~

~~The Office of the Interconnection will post on the Office of the Interconnection website a spreadsheet of the THI values for all relevant weather stations located within the PJM region.~~

~~The regression analysis will produce a slope (m), expressing in kW/THI, and an intercept (b), expressed in kW, that describes the sensitivity of the end-use customer’s load to weather.~~

~~Step 2: Determine the average THI for the on-peak hours for the five days used in the weekday CBL calculation.~~

~~Step 3: Determine the average THI for the on-peak hours of the event day.~~

~~Step 4: Calculate the WSA based on the following formula:~~

$$\text{WSA} = [(m \times \text{THI}_{\text{EVENT DAY}}) + b] / [(m \times \text{THI}_{\text{CBL DAYS}}) + b]$$

~~Simplified Analysis (available only for the summer period and for the Real-time Energy Market)~~

~~Step 1: Determine that the load is weather sensitive by agreement of the end-use customer, the Curtailment Service Provider, and the Load Serving Entity or by the Office of the Interconnection if there is no agreement. Weather adjustments could be negative or positive.~~

~~Step 2: Show that the hourly temperature reading at the nearest airport that provides weather information to the Office of the Interconnection equaled or exceeded 85 degrees Fahrenheit during each hour of the reduction event. The hourly temperature reading of another major~~

~~airport nearby the end-use customer's location may be used if it can be shown that the temperature at the end-use customer's location correlates more closely.~~

~~Step 3: Calculate the average hourly load over two full hours beginning three hours prior to the Load Reduction Event.~~

~~Step 4: Calculate the average hourly load for the same hours using the values given by the CBL calculation.~~

~~Step 5: Compare the resulting average two hour loads from Steps 3 and 4.~~

~~Step 6: Determine if the difference from Step 5 expressed as a percentage is greater than 5 percent. If the difference is greater than 5 percent then the percentage will be the WSA for the reduction event.~~

~~Step 7: Submit an Excel spreadsheet to the Office of the Interconnection documenting the weather adjustment.~~

- ~~• The WSA, expressed in percentage terms, shall be applied to each hour of the CBL during the event period in order to establish a weather-adjusted CBL.~~
- ~~• For end-use customers without interval data from the previous summer that select the regression analysis, the WSA shall initially be set at 100 percent. After one month of actual program response, a regression analysis shall be performed and the WSA shall be adjusted in accordance with Steps 1-4 above.~~
- ~~• In no event shall application of the WSA produce a weather-adjusted CBL that exceeds the end-use customer's historical, seasonal, on-peak non-coincident peak load.~~

~~Symmetric Additive Adjustment~~

Step 1: Calculate the average usage over the 3 hour period ending 1 hour prior to the start of event.

Step 2: Calculate the average usage over the 3 hour period in the CBL that corresponds to the 3 hour period described in Step 1.

Step 3: Subtract the results of Step 2 from the results of Step 1 to determine the symmetric additive adjustment (this may be positive or negative).

Step 4: Add the symmetric additive adjustment (i.e. the results of Step 3) to each hour in the CBL that corresponds to each event hour.

(b) Following a Load Reduction Event that is submitted to the Office of the Interconnection for compensation, the Office of the Interconnection shall provide the Notification window(s), if applicable, directly metered data and Customer Baseline Load and

~~Weather Sensitive Symmetric Additive~~ Adjustment calculations to the appropriate electric distribution company ~~or Load Serving Entity~~ for optional review. The electric distribution company ~~or Load Serving Entity~~ will have ten business days to provide the Office of the Interconnection with notification of any issues related to the metered data or calculations.

3.3A.4 Net Benefits Test.

The Office of the Interconnection shall identify each month the price on a supply curve, representative of conditions expected for that month, at which the benefit of load reductions provided by Economic Load Response Participants exceed the costs of those reductions to other loads. In formulaic terms, the net benefit is deemed to be realized at the price point on the supply curve where $(\text{Delta LMP} \times \text{MWh consumed}) > (\text{LMP}_{\text{NEW}} \times \text{DR})$, where LMP_{NEW} is the market clearing price after Economic Load Response is dispatched and Delta LMP is the price before Economic Load Response is dispatched minus the LMP_{NEW} .

The Office of the Interconnection shall update and post the Net Benefits Test results and analysis for a calendar month no later than the 15th day of the preceding calendar month. As more fully specified in the PJM Manuals, the Office of the Interconnection shall calculate the net benefit price level in accordance with the following steps:

Step 1. Retrieve generation offers from the same calendar month (of the prior calendar year) for which the calculation is being performed, employing market-based price offers to the extent available, and cost-based offers to the extent market-based price offers are not available. To the extent that generation offers are unavailable from historical data due to the addition of a Zone to the PJM Region the Office of the Interconnection shall use the most recent generation offers that best correspond to the characteristics of the calendar month for which the calculation is being performed, provided that at least 30 days of such data is available. If less than 30 days of data is available for a resource or group of resources, such resource[s] shall not be considered in the Net Benefits Test calculation.

Step 2: Adjust a portion of each prior-year offer representing the typical share of fuel costs in energy offers in the PJM Region, as specified in the PJM Manuals, for changes in fuel prices based on the ratio of the reference month spot price to the study month forward price. For such purpose, natural gas shall be priced at the Henry Hub price, number 2 fuel oil shall be priced at the New York Harbor price, and coal shall be priced as a blend of coal prices representative of the types of coal typically utilized in the PJM Region.

Step 3. Combine the offers to create daily supply curves for each day in the period.

Step 4. Average the daily curves for each day in the month to form an average supply curve for the study month.

Step 5. Use a non-linear least squares estimation technique to determine an equation that reasonably approximates and smooths the average supply curve.

Step 6. Determine the net benefit level as the point at which the price elasticity of supply is equal to 1 for the estimated supply curve equation established in Step 5.

3.3A.5 Market Settlements in Real-time Energy Market.

(a) Economic Load Response Participants that submit offers for load reductions in the Real time Energy Market no later than 6:00 p.m. on the day prior to the operating day that satisfy the Net Benefits Test and that are dispatched by the Office of the Interconnection ~~participating~~ in the Real-time Energy Market shall be compensated for reducing demand based on the actual kWh relief provided in excess of committed day-ahead load reductions. The offer shall contain the Offer Data specified in section 1.10.1A(k) and shall not thereafter be subject to change; provided, however, the Economic Load Response Participant may revise the previously specified minimum or maximum load reduction quantity for an operating hour by providing notice to the Office of the Interconnection in the form and manner specified in the PJM Manuals no later than three hours prior to such operating hour. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements. The Economic Load Response Participant that curtails or causes the curtailment of demand in real-time will be compensated by PJM Settlement at the real-time Locational ~~Market Marginal Price less an amount equal to the applicable generation and transmission charges.~~ The applicable generation and transmission charges are the charges ~~the participant would have otherwise paid the Load Serving Entity absent the demand reduction.~~

(b) In cases where the demand reduction ~~is dispatched follows dispatch, as defined in section 3.2.3(o-1), as instructed~~ by the Office of the Interconnection, payment will not be less than the total value of the demand reduction bid ~~less an amount equal to the applicable generation and transmission charges.~~ For the purposes of this section, the ~~applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction, and the~~ total value of a demand reduction bid shall include any submitted start-up costs associated with reducing demand, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the demand reduction must be committed.

Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, real-time operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) For purposes of load reductions qualifying for compensation hereunder, An Economic Load Response Participant shall accumulate credits for energy reductions in those hours when the energy delivered to the end-use customer is less than the end-use customer's Customer Baseline Load at the corresponding hourly rate. In the event that the end-use customer's hourly energy consumption is greater than the Customer Baseline Load, the Economic Load Response Participant will accumulate debits at the corresponding hourly rate for

the amount the end-use customer's hourly energy consumption is greater than the Customer Baseline Load. ~~However, in no event will the Economic Load Response Participant credit be reduced below zero on a daily basis. If the actual load reduction, compared to the desired load reduction is outside the deviation levels specified in section 3.2.3(o) of this Appendix, the Economic Load Response Participant shall be assessed balancing operating reserve charges in accordance with that section 3.2.3.~~

(d) ~~Economic Load Response Participants that have Locational Marginal Price-based contracts pursuant to which they have agreed to pay their Load Serving Entity for the physical delivery of energy according to the hour value of the real-time Locational Marginal Price as calculated by the Office of the Interconnection, may choose to reduce demand and be compensated for the reduction in the Real-time Energy Market under the following circumstances. The Economic Load Response Participant shall provide the Office of the Interconnection with a strike price for the end-use customer's zonal Locational Marginal Price at which the end-use customer will reduce demand, as well as any start-up costs associated with reducing load, including direct labor and equipment costs and opportunity costs and costs associated with the minimum number of contiguous hours for which the demand reduction must be committed. In cases where the Economic Load Response Participant's zonal Locational Marginal Price reaches the strike price and the demand reduction is dispatched by the Office of the Interconnection, PJM Settlement shall pay such Economic Load Response Participant the difference between the actual savings achieved based on zonal Locational Marginal Price and the total value of the end-use customer's demand reduction bid. For purposes of this provision the total value of the demand reduction bid will be the sum of the strike price times the MW of reduction achieved during each hour of the time period the demand reduction was dispatched by the Office of the Interconnection or the minimum down-time whichever is greater, plus the submitted start-up costs. Demand reductions hereunder will not be eligible to set real-time Locational Marginal Price. The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, with the ratio shares determined as follows:~~

~~The ratio share for LSE *i* in zone *z* shall be $RTL_{iz}/(RTL + X)$ and the ratio share for party *j* shall be $X_j/(RTL + X)$.~~

~~Where:~~

- ~~RTL is the total real time load in all zones where LMP > Net Benefits Test price;~~
- ~~RTL_{iz} is the real-time load for LSE *i* in zone *z*;~~
- ~~X is the total export quantity from PJM in that hour; and~~
- ~~X_j is the export quantity by party *j* from PJM.~~

3.3A.56 Market Settlements in the Day-ahead Energy Market.

(a) Economic Load Response Participants dispatched as a result of a qualifying demand reduction offer participating in the Day-ahead Energy Market shall be compensated for reducing demand based on the reductions of kWh committed in the Day-ahead Energy Market. An Economic Load Response Participant that submits a demand reduction bid day ahead that satisfies the Net Benefits Test and is accepted by the Office of the Interconnection shall be paid the day-ahead Locational Marginal Price

~~less an amount equal to the applicable generation and transmission charges. The applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements.~~

(b) Total payments to Economic Load Response Participants for accepted day-ahead demand reduction bids that follow the dispatch instructions of the Office of the Interconnection will not be less than the total value of the demand reduction bid ~~less an amount equal to the applicable generation and transmission charges.~~ For the purposes of this section, ~~the applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction, and~~ the total value of a demand reduction bid shall include any submitted start-up costs associated with reducing load, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the load reduction must be committed. Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, day-ahead operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) Economic Load Response Participants that have demand reductions committed in the Day-ahead Energy Market that deviate from the day-ahead schedule in real time shall be charged or credited for such variance at the real time LMP plus or minus an amount equal to the applicable balancing operating reserve charge in accordance with section 3.2.3 of this Appendix. Load Serving Entities that otherwise would have load that was reduced shall receive any associated operating reserve credit ~~plus, if the real-time Locational Marginal Price is higher than the day-ahead Locational Marginal Price during the shortfall, the difference between the day-ahead and the real-time Locational Marginal Price times the shortfall.~~

(d) ~~Economic Load Response Participants that have real-time Locational Marginal Price-based contracts may not participate in the Day-ahead Energy Market. The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share~~

basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average real-time Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, in accordance with the formula prescribed in section 3.3A.5(d).

3.3A.67 Prohibited Economic Load Response Participant Market Settlements.

(a) Settlements pursuant to Sections 3.3A.4-5 and 3.3A.5-6 shall be limited to demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market that satisfy the Net Benefits Test and are dispatched by the Office of the Interconnection.

(b) Demand reductions that do not meet the requirements of Section 3.3A.67(a) shall not be eligible for settlement pursuant to Sections 3.3A.4-5 and 3.3A.5-6. Examples of settlements prohibited pursuant to this Section 3.3A.67(b) include, but are not limited to, the following:

i. Settlements based on variable demand where the timing of the demand reduction supporting the settlement did not change in direct response to Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market;

ii. Consecutive daily settlements that are the result of a change in normal demand patterns that are submitted to maintain a CBL that no longer reflects the relevant end-use customer's demand;

iii. Settlements based on On-Site Generator data if the On Site Generation is not supporting demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market;

iv. Settlements based on demand reductions that are the result of operational changes between multiple end-use customer sites in the PJM footprint; ~~provided that, the foregoing notwithstanding, settlements based on such demand reduction shall be allowed if the demand reduction alleviates congestion.~~

v. Settlements that do not include all hours that the Office of the Interconnection dispatched the load reduction, or for which the load reduction cleared in the Day-ahead Market.

(c) The Office of the Interconnection shall disallow settlements for demand reductions that do not meet the requirements of Section 3.3A.67(a). If the Economic Load Response Participant continues to submit settlements for demand reductions that do not meet the requirements of Section 3.3A.67(a), then the Office of the Interconnection shall suspend the Economic Load Response Participant's PJM Interchange Energy Market activity and refer the matter to the FERC Office of Enforcement.

3.3A.78 Economic Load Response Participant Review Process.

(a) The Office of the Interconnection shall review the participation of an Economic Load Response Participant in the PJM Interchange Energy Market under the following circumstances:

i. An Economic Load Response Participant's registrations submitted pursuant to Section 1.5A.3 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).

ii. An Economic Load Response Participant's settlements pursuant to Sections 3.3A.4-5 and 3.3A.5-6 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).

iii. An Economic Load Response Participant's settlements pursuant to Sections 3.3A.4-5 and 3.3A.5-6 are denied by the Office of the Interconnection more than 10% of the time.

iv. An Economic Load Response Participant's registration will be reviewed when settlements are frequently submitted or if its actual loads frequently deviate from the previously scheduled quantities (as determined for purposes of assessing balancing operating reserves charges). PJM will notify the Participant when their registration is under review. While the Participant's registration is under review by PJM, the Participant may continue economic load reductions but all settlements will be denied by PJM until the registration review is resolved pursuant to subsection (i) or (ii) below. PJM will require the Participant to provide information within 30 days to support that the settlements were submitted for load reduction activity done in response to price and not submitted based on the End-Use Customer's normal operations.

i) If the Participant is unable to provide adequate supporting information to substantiate the load reductions submitted for settlement, PJM will terminate the registration and may refer the Participant to either the Market Monitoring Unit or the Federal Energy Regulatory Commission for further investigation.

ii) If the Participant does provide adequate supporting information, the settlements denied by PJM will be resubmitted by the Participant for review according to existing PJM market rules. Further, PJM may introduce an alternative Customer Baseline Load if the existing Customer Baseline Load does not adequately reflect what the customer load would have been absent a load reduction.

~~v. An Economic Load Response Participant's daily settlement will be denied by PJM based on the following criteria:~~

~~1) Submission of settlement for self-schedule energy in the Real-time Energy Market where only some of the self-scheduled hours have been included in the daily settlement submission; or~~

~~2) Daily settlement with an estimated value less than Five U.S. Dollars (\$5.00); or~~

~~3) Daily settlement has a significant number of uneconomic hours where the Locational Marginal Price is less than or equal to the generation plus the transmission portion of an end-use customer's retail rate or price.~~

vi. The electric distribution company ~~and the Load-Serving Entity~~ may only deny settlements during the normal settlement review process for inaccurate data including, but not limited to: meter data, line loss factor, Customer Baseline Load calculation, ~~retail rate~~, interval meter owner and a known recurring End-Use Customer outage or holiday.

(b) The Office of the Interconnection shall have thirty days to conduct a review pursuant to this Section 3.3A.78. The Office of the Interconnection may refer the matter to the PJM MMU and/or the FERC Office of Enforcement if the review indicates the relevant Economic Load Response Participant and/or relevant electric distribution company or LSE is engaging in activity that is inconsistent with the PJM Interchange Energy Market rules governing Economic Load Response Participants.

ATTACHMENT F

Revisions to the Schedule 1 of the PJM Operating Agreement (non-redlined)

1.3 Definitions.

1.3.1 Acceleration Request.

“Acceleration Request” shall mean a request pursuant to section 1.9.4A of this Schedule to accelerate or reschedule a transmission outage scheduled pursuant to sections 1.9.2 or 1.9.4.

1.3.1A Auction Revenue Rights.

“Auction Revenue Rights” or “ARRs” shall mean the right to receive the revenue from the Financial Transmission Right auction, as further described in Section 7.4 of this Schedule.

1.3.1B Auction Revenue Rights Credits.

“Auction Revenue Rights Credits” shall mean the allocated share of total FTR auction revenues or costs credited to each holder of Auction Revenue Rights, calculated and allocated as specified in Section 7.4.3 of this Schedule.

1.3.1B.01 Batch Load Demand Resource.

“Batch Load Demand Resource” shall mean a Demand Resource that has a cyclical production process such that at most times during the process it is consuming energy, but at consistent regular intervals, ordinarily for periods of less than ten minutes, it reduces its consumption of energy for its production processes to minimal or zero megawatts.

1.3.1B.02 Congestion Price.

“Congestion Price” shall mean the congestion component of the Locational Marginal Price, which is the effect on transmission congestion costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource, based on the effect of increased generation from or consumption by the resource on transmission line loadings, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.1B.03 Curtailment Service Provider.

“Curtailed Service Provider” or “CSP” shall mean a Member or a Special Member, which action on behalf of itself or one or more other Members or non-Members, participates in the PJM Interchange Energy Market by causing a reduction in demand.

1.3.1B.04 Day-ahead Congestion Price.

“Day-ahead Congestion Price” shall mean the Congestion Price resulting from the Day-ahead Energy Market.

1.3.1C Day-ahead Energy Market.

“Day-ahead Energy Market” shall mean the schedule of commitments for the purchase or sale of energy and payment of Transmission Congestion Charges developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1C.01 Day-ahead Loss Price.

“Day-ahead Loss Price” shall mean the Loss Price resulting from the Day-ahead Energy Market.

1.3.1D Day-ahead Prices.

“Day-ahead Prices” shall mean the Locational Marginal Prices resulting from the Day-ahead Energy Market.

1.3.1D.01 Day-ahead Scheduling Reserves.

“Day-ahead Scheduling Reserves” shall mean thirty-minute reserves as defined by the Reliability First Corporation and SERC.

1.3.1D.02 Day-ahead Scheduling Reserves Requirement.

“Day-ahead Scheduling Reserves Requirement” shall mean the thirty-minute reserve requirement for the PJM Region established consistent with Reliability First Corporation and SERC reliability standards, or those of any additional and/or successor regional reliability organization(s) that are responsible for establishing reliability requirements for the PJM Region, plus any additional thirty-minute reserves scheduled in response to an RTO-wide Hot or Cold Weather Alert or other reasons for conservative operations.

1.3.1D.03 Day-ahead Scheduling Reserves Resources.

“Day-ahead Scheduling Reserves Resources” shall mean synchronized and non-synchronized generation resources and Demand Resources electrically located within the PJM Region that are capable of providing Day-ahead Scheduling Reserves.

1.3.1D.04 Day-ahead Scheduling Reserves Market.

“Day-ahead Scheduling Reserves Market” shall mean the schedule of commitments for the purchase or sale of Day-ahead Scheduling Reserves developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1D.05 Day-ahead System Energy Price.

“Day-ahead System Energy Price” shall mean the System Energy Price resulting from the Day-ahead Energy Market.

1.3.1E Decrement Bid.

“Decrement Bid” shall mean a bid to purchase energy at a specified location in the Day-ahead Energy Market. An accepted Decrement Bid results in scheduled load at the specified location in the Day-ahead Energy Market.

1.31E.01 Demand Resource.

“Demand Resource” shall mean a resource with the capability to provide a reduction in demand.

1.3.1F Dispatch Rate.

“Dispatch Rate” shall mean the control signal, expressed in dollars per megawatt-hour, calculated and transmitted continuously and dynamically to direct the output level of all generation resources dispatched by the Office of the Interconnection in accordance with the Offer Data.

1.3.1G Energy Storage Resource.

“Energy Storage Resource” shall mean flywheel or battery storage facility solely used for short term storage and injection of energy at a later time to participate in the PJM energy and/or Ancillary Services markets as a Market Seller.

1.3.2 Equivalent Load.

“Equivalent Load” shall mean the sum of a Market Participant’s net system requirements to serve its customer load in the PJM Region, if any, plus its net bilateral transactions.

1.3.2A Economic Load Response Participant.

“Economic Load Response Participant” shall mean a Member or Special Member that qualifies under Section 1.5A of this Schedule to participate in the PJM Interchange Energy Market through reductions in demand.

1.3.2A.01 Economic Minimum.

“Economic Minimum” shall mean the lowest incremental MW output level a unit can achieve while following economic dispatch

1.3.2B Energy Market Opportunity Cost.

“Energy Market Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of available run hours due to limitations imposed on the unit by Applicable Laws and Regulations (as defined in PJM Tariff), and (b) the forecasted future hourly Locational Marginal Price at which the generating

unit could run while not violating such limitations. Energy Market Opportunity Cost therefore is the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same compliance period, which compliance period is determined by the applicable regulatory authority and is reflected in the rules set forth in PJM Manual 15. Energy Market Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Energy Market Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.3 External Market Buyer.

"External Market Buyer" shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for consumption by end-users outside the PJM Region, or for load in the PJM Region that is not served by Network Transmission Service.

1.3.4 External Resource.

"External Resource" shall mean a generation resource located outside the metered boundaries of the PJM Region.

1.3.5 Financial Transmission Right.

"Financial Transmission Right" or "FTR" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2 of this Schedule.

1.3.5A Financial Transmission Right Obligation.

"Financial Transmission Right Obligation" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(b) of this Schedule.

1.3.5B Financial Transmission Right Option.

"Financial Transmission Right Option" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(c) of this Schedule.

1.3.6 Generating Market Buyer.

"Generating Market Buyer" shall mean an Internal Market Buyer that is a Load Serving Entity that owns or has contractual rights to the output of generation resources capable of serving the Market Buyer's load in the PJM Region, or of selling energy or related services in the PJM Interchange Energy Market or elsewhere.

1.3.7 Generator Forced Outage.

“Generator Forced Outage” shall mean an immediate reduction in output or capacity or removal from service, in whole or in part, of a generating unit by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the facility, as specified in the relevant portions of the PJM Manuals. A reduction in output or removal from service of a generating unit in response to changes in market conditions shall not constitute a Generator Forced Outage.

1.3.8 Generator Maintenance Outage.

“Generator Maintenance Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit in order to perform necessary repairs on specific components of the facility, if removal of the facility meets the guidelines specified in the PJM Manuals.

1.3.9 Generator Planned Outage.

“Generator Planned Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit for inspection, maintenance or repair with the approval of the Office of the Interconnection in accordance with the PJM Manuals.

1.3.9A Increment Bid.

“Increment Bid” shall mean an offer to sell energy at a specified location in the Day-ahead Energy Market. An accepted Increment Bid results in scheduled generation at the specified location in the Day-ahead Energy Market.

1.3.9B Interface Pricing Point.

“Interface Pricing Point” shall have the meaning specified in section 2.6A.

1.3.10 Internal Market Buyer.

“Internal Market Buyer” shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for ultimate consumption by end-users inside the PJM Region that are served by Network Transmission Service.

1.3.11 Inadvertent Interchange.

“Inadvertent Interchange” shall mean the difference between net actual energy flow and net scheduled energy flow into or out of the individual Control Areas operated by PJM.

1.3.11.01 Load Management.

“Load Management” shall mean either a Demand Resource (“DR”) or an Interruptible Load for Reliability (“ILR”) resource, both as defined in the Reliability Assurance Agreement.

1.3.11A Load Reduction Event.

“Load Reduction Event” shall mean a reduction in demand by a Member or Special Member for the purpose of participating in the PJM Interchange Energy Market.

1.3.11B Loss Price.

“Loss Price” shall mean the loss component of the Locational Marginal Price, which is the effect on transmission loss costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource based on the effect of increased generation from or consumption by the resource on transmission losses, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.12 Market Operations Center.

“Market Operations Center” shall mean the equipment, facilities and personnel used by or on behalf of a Market Participant to communicate and coordinate with the Office of the Interconnection in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.12A Maximum Emergency.

“Maximum Emergency” shall mean the designation of all or part of the output of a generating unit for which the designated output levels may require extraordinary procedures and therefore are available to the Office of the Interconnection only when the Office of the Interconnection declares a Maximum Generation Emergency and requests generation designated as Maximum Emergency to run. The Office of the Interconnection shall post on the PJM website the aggregate amount of megawatts that are classified as Maximum Emergency.

1.3.13 Maximum Generation Emergency.

“Maximum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection to address either a generation or transmission emergency in which the Office of the Interconnection anticipates requesting one or more Generation Capacity Resources, or Non-Retail Behind The Meter Generation resources to operate at its maximum net or gross electrical power output, subject to the equipment stress limits for such Generation Capacity Resource or Non-Retail Behind The Meter resource in order to manage, alleviate, or end the Emergency.

1.3.14 Minimum Generation Emergency.

“Minimum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection in which the Office of the Interconnection anticipates requesting one or more generating resources to operate at or below Normal Minimum Generation, in order to manage, alleviate, or end the Emergency.

1.3.14A NERC Interchange Distribution Calculator.

“NERC Interchange Distribution Calculator” shall mean the NERC mechanism that is in effect and being used to calculate the distribution of energy, over specific transmission interfaces, from energy transactions.

1.3.14B Net Benefits Test.

“Net Benefits Test” shall mean a calculation to determine whether the benefits of a reduction in price resulting from the dispatch of Economic Load Response exceeds the cost to other loads resulting from the billing unit effects of the load reduction, as specified in Section 3.3A.4 of this Schedule.

1.3.15 Network Resource.

“Network Resource” shall have the meaning specified in the PJM Tariff.

1.3.16 Network Service User.

“Network Service User” shall mean an entity using Network Transmission Service.

1.3.17 Network Transmission Service.

“Network Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part III of the PJM Tariff, or transmission service comparable to such service that is provided to a Load Serving Entity that is also a Transmission Owner.

1.3.17A Non-Regulatory Opportunity Cost.

“Non-Regulatory Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) a fuel supply limitation, for up to one year, resulting from an event of force majeure; and, (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Non-Regulatory Opportunity Cost therefore is the value associated with a specific generating unit’s lost opportunity to produce energy during a higher valued period of time occurring within the same period of time in which the unit is bound by the referenced restrictions, and is reflected in the rules set forth in PJM Manual 15. Non-Regulatory Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Non-Regulatory Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.17B Non-Variable Loads.

“Non-Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.18 Normal Maximum Generation.

“Normal Maximum Generation” shall mean the highest output level of a generating resource under normal operating conditions.

1.3.19 Normal Minimum Generation.

“Normal Minimum Generation” shall mean the lowest output level of a generating resource under normal operating conditions.

1.3.20 Offer Data.

“Offer Data” shall mean the scheduling, operations planning, dispatch, new resource, and other data and information necessary to schedule and dispatch generation resources and Demand Resource(s) for the provision of energy and other services and the maintenance of the reliability and security of the transmission system in the PJM Region, and specified for submission to the PJM Interchange Energy Market for such purposes by the Office of the Interconnection.

1.3.21 Office of the Interconnection Control Center.

“Office of the Interconnection Control Center” shall mean the equipment, facilities and personnel used by the Office of the Interconnection to coordinate and direct the operation of the PJM Region and to administer the PJM Interchange Energy Market, including facilities and equipment used to communicate and coordinate with the Market Participants in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.21A On-Site Generators.

“On-Site Generators” shall mean generation facilities (including Behind The Meter Generation) that (i) are not Capacity Resources, (ii) are not injecting into the grid, (iii) are either synchronized or non-synchronized to the Transmission System, and (iv) can be used to reduce demand for the purpose of participating in the PJM Interchange Energy Market.

1.3.22 Operating Day.

“Operating Day” shall mean the daily 24 hour period beginning at midnight for which transactions on the PJM Interchange Energy Market are scheduled.

1.3.23 Operating Margin.

“Operating Margin” shall mean the incremental adjustments, measured in megawatts, required in PJM Region operations in order to accommodate, on a first contingency basis, an operating contingency in the PJM Region resulting from operations in an interconnected Control Area. Such adjustments may result in constraints causing Transmission Congestion Charges, or may result in Ancillary Services charges pursuant to the PJM Tariff.

1.3.24 Operating Margin Customer.

“Operating Margin Customer” shall mean a Control Area purchasing Operating Margin pursuant to an agreement between such other Control Area and the LLC.

1.3.25 PJM Interchange.

“PJM Interchange” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds, or is exceeded by, the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller; or (e) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (f) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.26 PJM Interchange Export.

“PJM Interchange Export” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load is exceeded by the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup sales; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller.

1.3.27 PJM Interchange Import.

“PJM Interchange Import” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup purchases; or (c) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (d) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.28 PJM Open Access Same-time Information System.

“PJM Open Access Same-time Information System” shall mean the electronic communication system for the collection and dissemination of information about transmission services in the PJM Region, established and operated by the Office of the Interconnection in accordance with FERC standards and requirements.

1.3.28A Planning Period Quarter.

“Planning Period Quarter” shall mean any of the following three month periods in the Planning Period: June, July and August; September, October and November; December, January and February; or March, April and May.

1.3.28B Planning Period Balance.

“Planning Period Balance” shall mean the entire period of time remaining in the Planning Period following the month that a monthly auction is conducted.

1.3.29 Point-to-Point Transmission Service.

“Point-to-Point Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part II of the PJM Tariff.

1.3.30 Ramping Capability.

“Ramping Capability” shall mean the sustained rate of change of generator output, in megawatts per minute.

1.3.30.01 Real-time Congestion Price.

“Real-time Congestion Price” shall mean the Congestion Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30.02 Real-time Loss Price.

“Real-time Loss Price” shall mean the Loss Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30A Real-time Prices.

“Real-time Prices” shall mean the Locational Marginal Prices resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30B Real-time Energy Market.

“Real-time Energy Market” shall mean the purchase or sale of energy and payment of Transmission Congestion Charges for quantity deviations from the Day-ahead Energy Market in the Operating Day.

1.3.30B.01 Real-time System Energy Price.

“Real-time System Energy Price” shall mean the System Energy Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.31 Regulation.

“Regulation” shall mean the capability of a specific generation resource or Demand Resource with appropriate telecommunications, control and response capability to increase or decrease its output or adjust load in response to a regulating control signal, in accordance with the specifications in the PJM Manuals.

1.3.31.01 Residual Auction Revenue Rights.

“Residual Auction Revenue Rights” shall mean incremental stage 1 Auction Revenue Rights created within a Planning Period by an increase in transmission system capability or a change in any other relevant factor that was not modeled pursuant to section 7.5 of Schedule 1 of this Agreement in compliance with section 7.4.2(h) of Schedule 1 of this Agreement, and, if modeled, would have increased the amount of stage 1 Auction Revenue Rights allocated pursuant to section 7.4.2 of Schedule 1 of this Agreement; provided that, the foregoing notwithstanding, Residual Auction Revenue Rights shall exclude: 1) Incremental Auction Revenue Rights allocated pursuant to Part VI of the Tariff; and 2) Auction Revenue Rights allocated to entities that are assigned cost responsibility pursuant to Schedule 6 of this Agreement for transmission upgrades that create such rights.

1.3.31.02 Special Member.

“Special Member” shall mean an entity that satisfies the requirements of Section 1.5A.02 of this Schedule or the special membership provisions established under the Emergency Load Response Program.

1.3.31A [Reserved.]

1.3.31B [Reserved.]

1.3.32 Spot Market Backup.

“Spot Market Backup” shall mean the purchase of energy from, or the delivery of energy to, the PJM Interchange Energy Market in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason.

1.3.33 Spot Market Energy.

“Spot Market Energy” shall mean energy bought or sold by Market Participants through the PJM Interchange Energy Market at System Energy Prices determined as specified in Section 2 of this Schedule.

1.3.33A State Estimator.

“State Estimator” shall mean the computer model of power flows specified in Section 2.3 of this Schedule.

1.3.33B Station Power.

“Station Power” shall mean energy used for operating the electric equipment on the site of a generation facility located in the PJM Region or for the heating, lighting, air-conditioning and office equipment needs of buildings on the site of such a generation facility that are used in the operation, maintenance, or repair of the facility. Station Power does not include any energy (i) used to power synchronous condensers; (ii) used for pumping at a pumped storage facility; (iii) used for compressors at a compressed air energy storage facility; (iv) used for charging an Energy Storage Resource; or (v) used in association with restoration or black start service.

1.3.33B.01 Synchronized Reserve.

“Synchronized Reserve” shall mean the reserve capability of generation resources that can be converted fully into energy or Demand Resources whose demand can be reduced within ten minutes from the request of the Office of the Interconnection dispatcher, and is provided by equipment that is electrically synchronized to the Transmission System.

1.3.33B.02 Synchronized Reserve Event.

“Synchronized Reserve Event” shall mean a request from the Office of the Interconnection to generation resources and/or Demand Resources able, assigned or self-scheduled to provide Synchronized Reserve, within ten minutes, to increase the energy output or reduce load by the amount of assigned or self-scheduled Synchronized Reserve capability.

1.3.33B.03 System Energy Price.

“System Energy Price” shall mean the energy component of the Locational Marginal Price, which is the price at which the Market Seller has offered to supply an additional increment of energy from a resource, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.33C Target Allocation.

“Target Allocation” shall mean the allocation of Transmission Congestion Credits as set forth in Section 5.2.3 of this Schedule or the allocation of Auction Revenue Rights Credits as set forth in Section 7.4.3 of this Schedule.

1.3.34 Transmission Congestion Charge.

“Transmission Congestion Charge” shall mean a charge attributable to the increased cost of energy delivered at a given load bus when the transmission system serving that load bus is operating under constrained conditions, or as necessary to provide energy for third-party transmission losses in accordance with Section 9.3, which shall be calculated and allocated as specified in Section 5.1 of this Schedule.

1.3.35 Transmission Congestion Credit.

“Transmission Congestion Credit” shall mean the allocated share of total Transmission Congestion Charges credited to each holder of Financial Transmission Rights, calculated and allocated as specified in Section 5.2 of this Schedule.

1.3.36 Transmission Customer.

“Transmission Customer” shall mean an entity using Point-to-Point Transmission Service.

1.3.37 Transmission Forced Outage.

“Transmission Forced Outage” shall mean an immediate removal from service of a transmission facility by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the transmission facility, as specified in the relevant portions of the PJM Manuals. A removal from service of a transmission facility at the request of the Office of the Interconnection to improve transmission capability shall not constitute a Forced Transmission Outage.

1.3.37A Transmission Loading Relief.

“Transmission Loading Relief” shall mean NERC’s procedures for preventing operating security limit violations, as implemented by PJM as the security coordinator responsible for maintaining transmission security for the PJM Region.

1.3.37B Transmission Loading Relief Customer.

“Transmission Loading Relief Customer” shall mean an entity that, in accordance with Section 1.10.6A, has elected to pay Transmission Congestion Charges during Transmission Loading Relief in order to continue energy schedules over contract paths outside the PJM Region that are increasing the cost of energy in the PJM Region.

1.3.37C Transmission Loss Charge.

“Transmission Loss Charge” shall mean the charges to each Market Participant, Network Customer, or Transmission Customer for the cost of energy lost in the transmission of electricity from a generation resource to load as specified in Section 5 of this Schedule.

1.3.38 Transmission Planned Outage.

“Transmission Planned Outage” shall mean any transmission outage scheduled in advance for a pre-determined duration and which meets the notification requirements for such outages specified in this Agreement or the PJM Manuals.

1.3.38A Variable Loads.

“Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.39 Zonal Base Load.

“Zonal Base Load” shall mean the lowest daily zonal peak load from the twelve month period ending October 21 of the calendar year immediately preceding the calendar year in which an annual Auction Revenue Right allocation is conducted, increased by the projected load growth rate for the relevant Zone.

1.5A Economic Load Response Participant.

As used in this section 1.5A, the term “end-use customer” refers to an individual location or aggregation of locations that consume electricity as identified by a unique electric distribution company account number.

1.5A.1 Qualification.

A Member or Special Member that is an end-use customer, Load Serving Entity or Curtailment Service Provider that has the ability to cause a reduction in demand as metered on an electric distribution company account basis or has an On-Site Generator that enables demand reduction may become an Economic Load Response Participant by complying with the requirements of the applicable Relevant Electric Retail Regulatory Authority and all other applicable federal, state and local regulatory entities together with this section 1.5A including, but not limited to, section 1.5A.3. A Member or Special Member may aggregate multiple individual end-use customer sites to qualify as an Economic Load Response Participant, subject to the requirements of Section 1.5A.10.

1.5A.2 Special Member.

Entities that are not Members and desire to participate solely in the Real-time Energy Market by reducing demand may become a Special Member by paying an annual membership fee of \$500 plus 10% of each payment owed by PJM Settlement for a Load Reduction Event not to exceed \$5,000 in a calendar year. For entities that become Special Members pursuant to this section, the following obligations are waived: (1) the \$1,500 membership application fee set forth in section 1.4.3 of this Agreement; (ii) liability under section 15.2 of this Agreement for Member defaults; (iii) thirty days notice for waiting period; and (iv) the requirement for 24/7 control center coverage. In addition, such Members shall not have voting privileges in committees or sector designations, and shall not be permitted to form user groups. On January 1 of a calendar year, a Special Member under this section, at its sole election, may become a Member rather than a Special Member subject to all rules governing being a Member, including regular application and membership fee requirements.

1.5A.3 Registration.

1. Prior to participating in the PJM Interchange Energy Market or Ancillary Services Market, Economic Load Response Participants must complete the Economic Load Response Registration Form posted on the Office of the Interconnection’s website and submit such form to the Office of the Interconnection for each end-use customer, or aggregation of end-use customers, pursuant to the requirements set forth in the PJM Manuals.

a. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the appropriate

electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is subject to another contractual obligation or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program. The electric distribution company or Load Serving Entity shall have ten business days to respond. An electric distribution company or Load Serving Entity which seeks to assert that the laws or regulations of the Relevant Electric Retail Regulatory Authority prohibit or condition (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response program shall provide to PJM, within the referenced ten business day review period, either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall assume that the load to be reduced is not subject to other contractual obligations or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program, and the Office of the Interconnection shall accept the registration, provided it meets the requirements of this section 1.5A

b. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:

i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the appropriate electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is permitted to participate in PJM's Economic Load Response Program. The electric distribution company or Load Serving Entity shall have ten business days to respond. If the electric distribution company or Load Serving Entity verifies that the load that may be reduced is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then the electric distribution company or Load Serving Entity must provide to the Office of the Interconnection within the referenced ten business day review period evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of

either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall reject the registration. If it is able to do so in compliance with section 1.5A hereof, including section 1.5A.3, the Economic Load Response Participant may submit a new registration for consideration if a prior registration has been rejected pursuant to this subsection.

2. In the event that the end-use customer is subject to another contractual obligation, special settlement terms may be employed to accommodate such contractual obligation. The Office of the Interconnection shall notify the end-use customer or appropriate Curtailment Service Provider, electric distribution company or Load Serving Entity that the Economic Load Response Participant has or has not met the requirements of this section 1.5A. End-use customers that desire not to be simultaneously registered to reduce demand under the Emergency Load Response Program and under this section, upon one-day advance notice to the Office of the Interconnection, may switch its registration for reducing demand, if it has been registered to reduce load for 15 consecutive days under its current registration.

1.5A.3.01 Economic Load Response Registrations in Effect as of August 28, 2009

1. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

a. Effective as of the later of either August 28, 2009 (the effective date of Wholesale Competition in Regions with Organized Electric Markets, Order 719-A, 128 FERC ¶ 61,059 (2009) ("Order 719-A")) or the effective date of a Relevant Electric Retail Regulatory Authority law or regulation prohibiting or conditioning (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response Program, the existing Economic Load Response Participant's registration submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated upon an electric distribution company or Load Serving Entity submitting to the Office of the Interconnection either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

- i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.
2. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:
 - a. Effective as of August 28, 2009 (the effective date of Order 719-A), an existing Economic Load Response Participants' registrations submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated unless an electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program and provides evidence to the Office of the Interconnection documenting that the permission or conditional permission is pursuant to the laws or regulations of the Relevant Electric Retail Regulatory Authority. If the electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then, within ten business days of verifying such permission or conditional permission, the electric distribution company or Load Serving Entity must provide to the Office of the Interconnection evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.
- i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.
3. All registrations submitted to the Office of the Interconnection on or after August 28, 2009, including requests to extend existing registrations, will be processed by the Office of the Interconnection in accordance with the provisions of section 1.5A, including section 1.5A.3.

1.5A.4 Metering and Electronic Dispatch Signal.

a) The Curtailment Service Provider is responsible to ensure that the Economic Load Response Participants have metering equipment that provides integrated hourly kWh values on an electric distribution company account basis. The metering equipment shall either meet the electric distribution company requirements for accuracy, or have a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment and associated data shall meet the requirements set forth herein and in the PJM Manuals. The Economic Load Response Participant must meter reductions in demand either by recording integrated hourly values for On-Site Generators running to serve local load (net of output used by the On-Site Generator), by metering load on an electric distribution company account basis and comparing actual metered load to its Customer Baseline Load, calculated pursuant to section 3.3A of this Schedule, or on an alternative metering basis approved by the Office of the Interconnection and agreed upon by all relevant parties, including any Curtailment Service Provider, Load Serving Entity and end-use customer. To qualify for compensation for such load reductions that are not metered directly by the Office of the Interconnection, hourly data reflecting meter readings for each day during which the load reduction occurred and all associated days to determine the reduction must be submitted to the Office of the Interconnection in accordance with the PJM Manuals within 60 days of the load reduction.

b) Curtailment Service Providers shall be responsible for maintaining, or ensuring that Economic Load Response Participants maintain, the capability to receive and act upon an electronic dispatch signal from the Office of the Interconnection in accordance with any standards and specifications contained in the PJM Manuals.

1.5A.5 On-Site Generators.

An Economic Load Response Participant that intends to use an On-Site Generator for the purpose of reducing demand to participate in the PJM Interchange Energy Market shall represent to the Office of the Interconnection in writing that it holds all necessary environmental permits applicable to the operation of the On-Site Generator. Unless notified otherwise, the Office of the Interconnection shall deem such representation applies to each time the On-Site Generator is used to reduce demand to enable participation in the PJM Interchange Energy Market and that the On-Site Generator is being operated in compliance with all applicable permits, including any emissions, run-time limits or other operational constraints that may be imposed by such permits.

1.5A.6 Variable-Load Customers.

The loads of an Economic Load Response Participant shall be categorized as Variable or Non-variable at the time the load is registered, based on hourly load data for the most recent 60 days provided by the participant in the registration process; provided, however, that any alternative means of making such determination when 60 days of data is not available shall be subject to review and approval by the Office of the Interconnection. Non-Variable Loads shall be those for which the Customer Baseline Load calculation and adjustment methods prescribed by sections 3.3A.2 and 3.3A.3 result in a relative root mean square hourly error of twenty percent or less compared to the actual hourly loads based on the hourly load data provided in the registration

process and using statistical methods prescribed in the PJM Manuals. All other loads shall be Variable Loads.

1.5A.7 Non-Hourly Metered Customer Pilot.

Non-hourly metered customers may participate in the PJM Interchange Energy Market as Economic Load Response Participants on a pilot basis under the following circumstances. The customer or its Curtailment Service Provider or Load Serving Entity must propose an alternate method for measuring hourly demand reductions. The Office of the Interconnection shall approve alternate measurement mechanisms on a case-by-case basis for a time specified by the Office of the Interconnection ("Pilot Period"). In the event an alternative measurement mechanism is approved, the Office of the Interconnection shall notify the affected Load Serving Entity(ies) that a proposed alternate measurement mechanism has been approved for a Pilot Period. Demand reductions by non-hourly metered customers using alternate measurement mechanisms on a pilot basis shall be limited to a combined total of 500 MW of reductions in both the Emergency Load Response Program and the PJM Interchange Energy Market. With the sole exception of the requirement for hourly metering as set forth in Section 1.5A.04 of this Schedule, non-hourly metered customers that qualify as Economic Load Response Participants pursuant to this section 1.5A.07 shall be subject to the rules and procedures for participation by Economic Load Response Participants in the PJM Interchange Energy Market, including, without limitation, the Net Benefits Test and the requirement for dispatch by the Office of the Interconnection. Following completion of a Pilot Period, the alternate method shall be evaluated by the Office of the Interconnection to determine whether such alternate method should be included in the PJM Manuals as an accepted measurement mechanism for demand reductions in the PJM Interchange Energy Market.

1.5A.8 Batch Load Demand Resource Provision of Synchronized Reserve or Day-ahead Scheduling Reserves.

(a) A Batch Load Demand Resource may provide Synchronized Reserve or Day-ahead Scheduling Reserves in the PJM Interchange Energy Market provided it has pre-qualified by providing the Office of the Interconnection with documentation acceptable to the Office of the Interconnection that shows six months of one minute incremental load history of the Batch Load Demand Resource, or in the event such history is unavailable, other such information or data acceptable to the Office of the Interconnection to demonstrate that the resource meets the definition of "Batch Load Demand Resource" pursuant to section 1.3.1A.001 of this Schedule. This requirement is a one-time pre-qualification requirement for a Batch Load Demand Resource.

(b) Batch Load Demand Resources may provide up to 20 percent of the total system-wide PJM Synchronized Reserve requirement in any hour, or up to 20 percent of the total system-wide Day-ahead Scheduling Reserves requirement in any hour; provided, however, that in the event the Office of the Interconnection determines in its sole discretion that satisfying 20 percent of either such requirement from Batch Load Demand Resources is causing or may cause a reliability degradation, the Office of the Interconnection may reduce the percentage of either such requirement that may be satisfied by Batch Load Demand Resources in any hour to as low

as 10 percent. This reduction will be effective seven days after the posting of the reduction on the PJM website. Notwithstanding anything to the contrary in this Agreement, as soon as practicable, the Office of the Interconnection unilaterally shall make a filing under section 205 of the Federal Power Act to revise the rules for Batch Load Demand Resources so as to continue such reduction. The reduction shall remain in effect until the Commission acts upon the Office of the Interconnection's filing and thereafter if approved or accepted by the Commission.

(c) A Batch Load Demand Resource that is consuming energy at the start of a Synchronized Reserve Event, or, if committed to provide Day-ahead Scheduling Reserves, at the time of a dispatch instruction from the Office of the Interconnection to reduce load, shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event, or to such instruction to reduce load, by reducing load as quickly as it is capable and by keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following the reduction, or, in the case of Day-ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required. A Batch Load Demand Resource that has reduced its consumption of energy for its production processes to minimal or zero megawatts before the start of a Synchronized Reserve Event (or, in the case of Day-ahead Scheduling Reserves, before a dispatch instruction to reduce load) shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event (or such instruction to reduce load) by reducing any load that is present at the time the Synchronized Reserve Event is called (or at the time of such instruction to reduce load) as quickly as it is capable, delaying the restart of its production processes, and keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following any such reduction (or, in the case of Day-ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required). Failure to respond as described in this section shall be considered non-compliance with the Office of the Interconnection's dispatch instruction associated with a Synchronized Reserve Event, or as applicable, associated with an instruction to a resource committed to provide Day-ahead Scheduling Reserves to reduce load.

1.5A.9 Day-ahead and Real-time Energy Market Participation.

Economic Load Response Participants shall be compensated under section 3.3A.5 and 3.3A.6 only if they participate in the Day-ahead or Real-time Energy Markets as a dispatchable resource.

1.5A.10 Economic Load Response Participant Aggregation.

The purpose for aggregation is to allow the participation of End-Use Customers in the Energy Market that can provide less than 100 kW of demand response when they currently have no alternative opportunity to participate on an individual basis or can provide less than 500 kW of demand response in the Day-Ahead Scheduling Reserve, Synchronized Reserve or Regulation markets when they currently have no alternative opportunity to participate on an individual basis. Aggregations pursuant to Section 1.5A.1 shall be subject to the following requirements:

- i. All End-Use Customers in an aggregation shall be specifically identified;

- ii. All End-Use Customers in an aggregation shall be served by the same electric distribution company or Load Serving Entity where the electric distribution company is the Load Serving Entity for all End-Use Customers in the aggregation. If the aggregation will provide Synchronized Reserves, all customers in the aggregation must also be part of the same Synchronized Reserve sub-zone;
- iii. All End-Use Customers in an aggregation that settle at Transmission Zone, existing load aggregate, or node prices shall be located in the same Transmission Zone, existing load aggregate or at the same node, respectively;
- iv. A single CBL for the aggregation shall be used to determine settlements pursuant to Sections 3.3A.5 and 3.3A.6;
- v. If the aggregation will only provide energy to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 99 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve. If the aggregation will provide an Ancillary Service to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 499 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve;
- vi. Each End-Use Customer site must meet the requirements for market participation by a Demand Resource except for the 100 kW minimum load reduction requirement for energy or the 500 kW minimum load reduction requirement for Ancillary Services; and
- vii. An End-Use Customer's participation in the Energy and Ancillary Services markets shall be administered under one economic registration.

1.5A.11 Reporting

- (a) PJM will post on its website a report of demand response activity, and will provide a summary thereof to the PJM Markets and Reliability Committee on an annual basis.
- (b) As PJM receives evidence from the electric distribution companies or Load Serving Entities pursuant to section 1.5A.3, PJM will post on its website a list of those Relevant Electric Retail Regulatory Authorities that the electric distribution companies or Load Serving Entities assert prohibit or condition retail participation in PJM's Economic Load Response Program together with a corresponding reference to the Relevant Electric Retail Regulatory Authority evidence that is provided to PJM by the electric distribution companies or Load Serving Entities.

1.7 General.

1.7.1 Market Sellers.

Only Market Sellers shall be eligible to submit offers to the Office of the Interconnection for the sale of electric energy or related services in the PJM Interchange Energy Market. Market Sellers shall comply with the prices, terms, and operating characteristics of all Offer Data submitted to and accepted by the PJM Interchange Energy Market.

1.7.2 Market Buyers.

Only Market Buyers shall be eligible to purchase energy or related services in the PJM Interchange Energy Market. Market Buyers shall comply with all requirements for making purchases from the PJM Interchange Energy Market.

1.7.2A Economic Load Response Participants.

Only Economic Load Response Participants shall be eligible to participate in the Real-time Energy Market and the Day-ahead Energy Market by submitting offers to the Office of the Interconnection to reduce demand.

1.7.3 Agents.

A Market Participant may participate in the PJM Interchange Energy Market through an agent, provided that the Market Participant informs the Office of the Interconnection in advance in writing of the appointment of such agent. A Market Participant participating in the PJM Interchange Energy Market through an agent shall be bound by all of the acts or representations of such agent with respect to transactions in the PJM Interchange Energy Market, and shall ensure that any such agent complies with the requirements of this Agreement.

1.7.4 General Obligations of the Market Participants.

(a) In performing its obligations to the Office of the Interconnection hereunder, each Market Participant shall at all times (i) follow Good Utility Practice, (ii) comply with all applicable laws and regulations, (iii) comply with the applicable principles, guidelines, standards and requirements of FERC, NERC and Applicable Regional Reliability Councils, (iv) comply with the procedures established for operation of the PJM Interchange Energy Market and PJM Region and (v) cooperate with the Office of the Interconnection as necessary for the operation of the PJM Region in a safe, reliable manner consistent with Good Utility Practice.

(b) Market Participants shall undertake all operations in or affecting the PJM Interchange Energy Market and the PJM Region including but not limited to compliance with all Emergency procedures, in accordance with the power and authority of the Office of the Interconnection with respect to the operation of the PJM Interchange Energy Market and the PJM Region as established in this Agreement, and as specified in the Schedules to this Agreement and the PJM Manuals. Failure to comply with the foregoing operational requirements shall subject a Market

Participant to such reasonable charges or other remedies or sanctions for non-compliance as may be established by the PJM Board, including legal or regulatory proceedings as authorized by the PJM Board to enforce the obligations of this Agreement.

(c) The Office of the Interconnection may establish such committees with a representative of each Market Participant, and the Market Participants agree to provide appropriately qualified personnel for such committees, as may be necessary for the Office of the Interconnection and PJMSettlement to perform its obligations hereunder.

(d) All Market Participants shall provide to the Office of the Interconnection the scheduling and other information specified in the Schedules to this Agreement, and such other information as the Office of the Interconnection may reasonably require for the reliable and efficient operation of the PJM Region and PJM Interchange Energy Market, and for compliance with applicable regulatory requirements for posting market and related information. Such information shall be provided as much in advance as possible, but in no event later than the deadlines established by the Schedules to this Agreement, or by the Office of the Interconnection in conformance with such Schedules. Such information shall include, but not be limited to, maintenance and other anticipated outages of generation or transmission facilities, scheduling and related information on bilateral transactions and self-scheduled resources, and implementation of active load management, interruption of load, and other load reduction measures. The Office of the Interconnection shall abide by appropriate requirements for the non-disclosure and protection of any confidential or proprietary information given to the Office of the Interconnection by a Market Participant. Each Market Participant shall maintain or cause to be maintained compatible information and communications systems, as specified by the Office of the Interconnection, required to transmit scheduling, dispatch, or other time-sensitive information to the Office of the Interconnection in a timely manner.

(e) Subject to the requirements for Economic Load Response participants in section 1.5A above, each Market Participant shall install and operate, or shall otherwise arrange for, metering and related equipment capable of recording and transmitting all voice and data communications reasonably necessary for the Office of the Interconnection and PJMSettlement to perform the services specified in this Agreement. A Market Participant that elects to be separately billed for its PJM Interchange shall, to the extent necessary, be individually metered in accordance with Section 14 of this Agreement, or shall agree upon an allocation of PJM Interchange between it and the Market Participant through whose meters the unmetered Market Participant's PJM Interchange is delivered. The Office of the Interconnection shall be notified of the allocation by the foregoing Market Participants.

(f) Each Market Participant shall operate, or shall cause to be operated, any generating resources owned or controlled by such Market Participant that are within the PJM Region or otherwise supplying energy to or through the PJM Region in a manner that is consistent with the standards, requirements or directions of the Office of the Interconnection and that will permit the Office of the Interconnection to perform its obligations under this Agreement; provided, however, no Market Participant shall be required to take any action that is inconsistent with Good Utility Practice or applicable law.

(g) Each Market Participant shall follow the directions of the Office of the Interconnection to take actions to prevent, manage, alleviate or end an Emergency in a manner consistent with this Agreement and the procedures of the PJM Region as specified in the PJM Manuals.

(h) Each Market Participant shall obtain and maintain all permits, licenses or approvals required for the Market Participant to participate in the PJM Interchange Energy Market in the manner contemplated by this Agreement.

(i) Consistent with Section 36.1.1 of the PJM Tariff, to the extent its generating facility is dispatchable, a Market Participant shall submit an Economic Minimum in the Real-time Energy Market that is no greater than the higher of its physical operating minimum or its Capacity Interconnection Rights, as that term is defined in the PJM Tariff, associated with such generating facility under its Interconnection Service Agreement under Attachment O of the PJM Tariff or a wholesale market participation agreement.

1.7.5 Market Operations Center.

Each Market Participant shall maintain a Market Operations Center, or shall make appropriate arrangements for the performance of such services on its behalf. A Market Operations Center shall meet the performance, equipment, communications, staffing and training standards and requirements specified in this Agreement for the scheduling and completion of transactions in the PJM Interchange Energy Market and the maintenance of the reliable operation of the PJM Region, and shall be sufficient to enable (i) a Market Seller or an Economic Load Response Participant to perform all terms and conditions of its offers to the PJM Interchange Energy Market, and (ii) a Market Buyer or an Economic Load Response Participant to conform to the requirements for purchasing from the PJM Interchange Energy Market.

1.7.6 Scheduling and Dispatching.

(a) The Office of the Interconnection shall schedule and dispatch in real-time generation resources and/or Demand Resources economically on the basis of least-cost, security-constrained dispatch and the prices and operating characteristics offered by Market Sellers, continuing until sufficient generation resources and/or Demand Resources are dispatched to serve the PJM Interchange Energy Market energy purchase requirements under normal system conditions of the Market Buyers, as well as the requirements of the PJM Region for ancillary services provided by generation resources and/or Demand Resources, in accordance with this Agreement. Such scheduling and dispatch shall recognize transmission constraints on coordinated flowgates external to the Transmission System in accordance with Appendix A to the Joint Operating Agreement between the Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C. (PJM Rate Schedule FERC No. 38) and on other such flowgates that are coordinated in accordance with agreements between the LLC and other entities. Scheduling and dispatch shall be conducted in accordance with this Agreement.

(b) The Office of the Interconnection shall undertake to identify any conflict or incompatibility between the scheduling or other deadlines or specifications applicable to the PJM Interchange Energy Market, and any relevant procedures of another Control Area, or any tariff

(including the PJM Tariff). Upon determining that any such conflict or incompatibility exists, the Office of the Interconnection shall propose tariff or procedural changes, and undertake such other efforts as may be appropriate, to resolve any such conflict or incompatibility.

(c) To protect its generation or distribution facilities, or local Transmission Facilities not under the monitoring responsibility and dispatch control of the Office of the Interconnection, an entity may request that the Office of the Interconnection schedule and dispatch generation or reductions in demand to meet a limit on Transmission Facilities different from that which the Office of the Interconnection has determined to be required for reliable operation of the Transmission System. To the extent consistent with its other obligations under this Agreement, the Office of the Interconnection shall schedule and dispatch generation and reductions in demand in accordance with such request. An entity that makes a request pursuant to this section 1.7.6(c) shall be responsible for all generation and other costs resulting from its request that would not have been incurred by operating the Transmission System and scheduling and dispatching generation in the manner that the Office of the Interconnection otherwise has determined to be required for reliable operation of the Transmission System.

1.7.7 Pricing.

The price paid for energy bought and sold in the PJM Interchange Energy Market and for demand reductions will reflect the hourly Locational Marginal Price at each load and generation bus, determined by the Office of the Interconnection in accordance with this Agreement. Transmission Congestion Charges and Transmission Loss Charges, which shall be determined by differences in Congestion Prices and Loss Prices in an hour, shall be calculated by the Office of the Interconnection, and collected by PJMSettlement, and the revenues therefrom shall be disbursed by PJMSettlement in accordance with this Schedule.

1.7.8 Generating Market Buyer Resources.

A Generating Market Buyer may elect to self-schedule its generation resources up to that Generating Market Buyer's Equivalent Load, in accordance with and subject to the procedures specified in this Schedule, and the accounting and billing requirements specified in Section 3 to this Schedule. PJMSettlement shall not be a contracting party with respect to such self-scheduled or self-supplied transactions.

1.7.9 Delivery to an External Market Buyer.

A purchase of Spot Market Energy by an External Market Buyer shall be delivered to a bus or buses at the electrical boundaries of the PJM Region specified by the Office of the Interconnection, or to load in such area that is not served by Network Transmission Service, using Point-to-Point Transmission Service paid for by the External Market Buyer. Further delivery of such energy shall be the responsibility of the External Market Buyer.

1.7.10 Other Transactions.

(a) Bilateral Transactions.

- (i) In addition to transactions in the PJM Interchange Energy Market, Market Participants may enter into bilateral contracts for the purchase or sale of electric energy to or from each other or any other entity, subject to the obligations of Market Participants to make Generation Capacity Resources available for dispatch by the Office of the Interconnection. Such bilateral contracts shall be for the physical transfer of energy to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eSchedules and Enhanced Energy Scheduler tools.
- (ii) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of energy to a Market Participant inside the PJM Region, title to the energy that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and the further transmission of the energy or further sale of the energy into the PJM Interchange Energy Market shall be transacted by the buyer under the bilateral contract. With respect to all bilateral contracts for the physical transfer of energy to an entity outside the PJM Region, title to the energy shall pass to the buyer at the border of the PJM Region and shall be delivered to the border using transmission service. In no event shall the purchase and sale of energy between Market Participants under a bilateral contract constitute a transaction in the PJM Interchange Energy Market or be construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.
- (iii) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of energy reported to and coordinated with the Office of the Interconnection under this Schedule shall use all reasonable efforts, consistent with Good Utility Practice, to limit the megawatt hours of such reported transactions to amounts reflecting the expected load and other physical delivery obligations of the buyer under the bilateral contract.
- (iv) All payments and related charges for the energy associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection or PJMSettlement. The LLC, PJMSettlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.
- (v) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any Spot Market Backup used to meet the bilateral contract seller's obligation to deliver energy

under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the Interconnection shall (i) not accept any new eSchedules or Enhanced Energy Scheduler reporting by the Market Participant and (ii) terminate all of the Market Participant's eSchedules and Enhanced Energy Schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the eSchedules and Enhanced Energy Schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection. PJMSettlement shall assign its claims against a seller with respect to a seller's nonpayment for Spot Market Backup to a buyer the extent that the buyer has made an indemnification payment to PJMSettlement with respect to the seller's nonpayment.

- (vi) Bilateral contracts that do not contemplate the physical transfer of energy to or from a Market Participant are not subject to this Schedule, shall not be reported to and coordinated with the Office of the Interconnection, and shall not in any way constitute a transaction in the PJM Interchange Energy Market.

(b) Market Participants shall have Spot Market Backup with respect to all bilateral transactions that contemplate the physical transfer of energy to or from a Market Participant, that are not dynamically scheduled pursuant to Section 1.12 and that are curtailed or interrupted for any reason (except for curtailments or interruptions through active load management for load located within the PJM Region).

(c) To the extent the Office of the Interconnection dispatches a Generating Market Buyer's generation resources, such Generating Market Buyer may elect to net the output of such resources against its hourly Equivalent Load. Such a Generating Market Buyer shall be deemed a buyer from the PJM Interchange Energy Market to the extent of its PJM Interchange Imports, and shall be deemed a seller to the PJM Interchange Energy Market to the extent of its PJM Interchange Exports.

(d) A Market Seller may self-supply Station Power for its generation facility in accordance with the following provisions:

- (i) A Market Seller may self-supply Station Power for its generation facility during any month (1) when the net output of such facility is positive, or (2) when the net output of such facility is negative and the Market Seller during the same month has available at other of its generation facilities

positive net output in an amount at least sufficient to offset fully such negative net output. For purposes of this subsection (d), “net output” of a generation facility during any month means the facility’s gross energy output, less the Station Power requirements of such facility, during that month. The determination of a generation facility’s or a Market Seller’s monthly net output under this subsection (d) will apply only to determine whether the Market Seller self-supplied Station Power during the month and will not affect the price of energy sold or consumed by the Market Seller at any bus during any hour during the month. For each hour when a Market Seller has positive net output and delivers energy into the Transmission System, it will be paid the LMP at its bus for that hour for all of the energy delivered. Conversely, for each hour when a Market Seller has negative net output and has received Station Power from the Transmission System, it will pay the LMP at its bus for that hour for all of the energy consumed.

- (ii) Transmission Provider will determine the extent to which each affected Market Seller during the month self-supplied its Station Power requirements or obtained Station Power from third-party providers (including affiliates) and will incorporate that determination in its accounting and billing for the month. In the event that a Market Seller self-supplies Station Power during any month in the manner described in subsection (1) of subsection (d)(i) above, Market Seller will not use, and will not incur any charges for, transmission service. In the event, and to the extent, that a Market Seller self-supplies Station Power during any month in the manner described in subsection (2) of subsection (d)(i) above (hereafter referred to as “remote self-supply of Station Power”), Market Seller shall use and pay for transmission service for the transmission of energy in an amount equal to the facility’s negative net output from Market Seller’s generation facility(ies) having positive net output. Unless the Market Seller makes other arrangements with Transmission Provider in advance, such transmission service shall be provided under Part II of the PJM Tariff and shall be charged the hourly rate under Schedule 8 of the PJM Tariff for Non-Firm Point-to-Point Transmission Service with an election to pay congestion charges, provided, however, that no reservation shall be necessary for such transmission service and the terms and charges under Schedules 1, 1A, 2 through 6, 9 and 10 of the PJM Tariff shall not apply to such service. The amount of energy that a Market Seller transmits in conjunction with remote self-supply of Station Power will not be affected by any other sales, purchases, or transmission of capacity or energy by or for such Market Seller under any other provisions of the PJM Tariff.
- (iii) A Market Seller may self-supply Station Power from its generation facilities located outside of the PJM Region during any month only if such generation facilities in fact run during such month and Market Seller

separately has reserved transmission service and scheduled delivery of the energy from such resource in advance into the PJM Region.

1.7.11 Emergencies.

(a) The Office of the Interconnection, with the assistance of the Members' dispatchers as it may request, shall be responsible for monitoring the operation of the PJM Region, for declaring the existence of an Emergency, and for directing the operations of Market Participants as necessary to manage, alleviate or end an Emergency. The standards, policies and procedures of the Office of the Interconnection for declaring the existence of an Emergency, including but not limited to a Minimum Generation Emergency, and for managing, alleviating or ending an Emergency, shall apply to all Members on a non-discriminatory basis. Actions by the Office of the Interconnection and the Market Participants shall be carried out in accordance with this Agreement, the NERC Operating Policies, Applicable Regional Reliability Council reliability principles and standards, Good Utility Practice, and the PJM Manuals. A declaration that an Emergency exists or is likely to exist by the Office of the Interconnection shall be binding on all Market Participants until the Office of the Interconnection announces that the actual or threatened Emergency no longer exists. Consistent with existing contracts, all Market Participants shall comply with all directions from the Office of the Interconnection for the purpose of managing, alleviating or ending an Emergency. The Market Participants shall authorize the Office of the Interconnection and PJMSettlement to purchase or sell energy on their behalf to meet an Emergency, and otherwise to implement agreements with other Control Areas interconnected with the PJM Region for the mutual provision of service to meet an Emergency, in accordance with this Agreement.

(b) To the extent load must be shed to alleviate an Emergency in a Control Zone, the Office of the Interconnection shall, to the maximum extent practicable, direct the shedding of load within such Control Zone. The Office of the Interconnection may shed load in one Control Zone to alleviate an Emergency in another Control Zone under its control only as necessary after having first shed load to the maximum extent practicable in the Control Zone experiencing the Emergency and only to the extent that PJM supports other control areas (not under its control) in those situations where load shedding would be necessary, such as to prevent isolation of facilities within the Eastern Interconnection, to prevent voltage collapse, or to restore system frequency following a system collapse; provided, however, that the Office of the Interconnection may not order a manual load dump in a Control Zone solely to address capacity deficiencies in another Control Zone. This subsection shall be implemented consistent with North American Electric Reliability Council and applicable reliability council standards.

1.7.12 Fees and Charges.

Each Market Participant, except for Special Members, shall pay all fees and charges of the Office of the Interconnection for operation of the PJM Interchange Energy Market as determined by and allocated to the Market Participant by the Office of the Interconnection in accordance with Schedule 3.

1.7.13 Relationship to the PJM Region.

The PJM Interchange Energy Market operates within and subject to the requirements for the operation of the PJM Region.

1.7.14 PJM Manuals.

The Office of the Interconnection shall be responsible for maintaining, updating, and promulgating the PJM Manuals as they relate to the operation of the PJM Interchange Energy Market. The PJM Manuals, as they relate to the operation of the PJM Interchange Energy Market, shall conform and comply with this Agreement, NERC operating policies, and Applicable Regional Reliability Council reliability principles, guidelines and standards, and shall be designed to facilitate administration of an efficient energy market within industry reliability standards and the physical capabilities of the PJM Region.

1.7.15 Corrective Action.

Consistent with Good Utility Practice, the Office of the Interconnection shall be authorized to direct or coordinate corrective action, whether or not specified in the PJM Manuals, as necessary to alleviate unusual conditions that threaten the integrity or reliability of the PJM Region, or the regional power system.

1.7.16 Recording.

Subject to the requirements of applicable State or federal law, all voice communications with the Office of the Interconnection Control Center may be recorded by the Office of the Interconnection and any Market Participant communicating with the Office of the Interconnection Control Center, and each Market Participant hereby consents to such recording.

1.7.17 Operating Reserves.

(a) The following procedures shall apply to any generation unit subject to the dispatch of the Office of the Interconnection for which construction commenced before July 9, 1996, or any Demand Resource subject to the dispatch of the Office of the Interconnection.

(b) The Office of the Interconnection shall schedule to the Operating Reserve and load-following objectives of the Control Zones of the PJM Region and the PJM Interchange Energy Market in scheduling generation resources and/or Demand Resources pursuant to this Schedule. A table of Operating Reserve objectives for each Control Zone is calculated and published annually in the PJM Manuals. Reserve levels are probabilistically determined based on the season's historical load forecasting error and forced outage rates.

(c) Nuclear generation resources shall not be eligible for Operating Reserve payments unless: 1) the Office of the Interconnection directs such resources to reduce output, in which case, such units shall be compensated in accordance with section 3.2.3(f) of this Schedule; or 2) the resource submits a request for a risk premium to the Market Monitoring Unit under the procedures specified in Section II.B of Attachment M - Appendix. A nuclear generation

resource (i) must submit a risk premium consistent with its agreement under such process, or, (ii) if it has not agreed with the Market Monitoring Unit on an appropriate risk premium, may submit its own determination of an appropriate risk premium to the Office of the Interconnection, subject to acceptance by the Office of the Interconnection, with or without prior approval from the Commission.

(d) PJMSettlement shall be the Counterparty to the purchases and sales of Operating Reserve in the PJM Interchange Energy Market.

1.7.18 Regulation.

(a) Regulation to meet the Regulation objective of each Regulation Zone shall be supplied from generation resources and/or Demand Resources located within the metered electrical boundaries of such Regulation Zone. Generating Market Buyers, and Market Sellers offering Regulation, shall comply with applicable standards and requirements for Regulation capability and dispatch specified in the PJM Manuals.

(b) The Office of the Interconnection shall obtain and maintain for each Regulation Zone an amount of Regulation equal to the Regulation objective for such Regulation Zone as specified in the PJM Manuals.

(c) The Regulation range of a generation unit or Demand Resource shall be at least twice the amount of Regulation assigned.

(d) A generation unit capable of automatic energy dispatch that is also providing Regulation shall have its energy dispatch range reduced by twice the amount of the Regulation provided. The amount of Regulation provided by a generation unit shall serve to redefine the Normal Minimum Generation and Normal Maximum Generation energy limits of that generation unit, in that the amount of Regulation shall be added to the generation unit's Normal Minimum Generation energy limit, and subtracted from its Normal Maximum Generation energy limit.

(e) Qualified Regulation must satisfy the verification tests described in the PJM Manuals.

1.7.19 Ramping.

A generator dispatched by the Office of the Interconnection pursuant to a control signal appropriate to increase or decrease the generator's megawatt output level shall be able to change output at the ramping rate specified in the Offer Data submitted to the Office of the Interconnection for that generator.

1.7.19A Synchronized Reserve.

(a) Synchronized Reserve shall be supplied from generation resources and/or Demand Resources located within the metered boundaries of the PJM Region. Generating Market Buyers, and Market Sellers offering Synchronized Reserve shall comply with applicable

standards and requirements for Synchronized Reserve capability and dispatch specified in the PJM Manuals.

(b) The Office of the Interconnection shall obtain and maintain for each Synchronized Reserve Zone an amount of Synchronized Reserve equal to the Synchronized Reserve objective for such Synchronized Reserve Zone, as specified in the PJM Manuals.

(c) The Synchronized Reserve capability of a generation resource and Demand Resource shall be the increase in energy output or load reduction achievable by the generation resource and Demand Resource within a continuous 10-minute period.

(d) A generation unit capable of automatic energy dispatch that also is providing Synchronized Reserve shall have its energy dispatch range reduced by the amount of the Synchronized Reserve provided. The amount of Synchronized Reserve provided by a generation unit shall serve to redefine the Normal Maximum Generation energy limit of that generation unit in that the amount of Synchronized Reserve provided shall be subtracted from its Normal Maximum Generation energy limit.

1.7.19B Bilateral Transactions Regarding Regulation, Synchronized Reserve and Day-ahead Scheduling Reserves.

(a) In addition to transactions in the Regulation market, Synchronized Reserve market, and Day-ahead Scheduling Reserves Market, Market Participants may enter into bilateral contracts for the purchase or sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from each other or any other entity. Such bilateral contracts shall be for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eMarket tools.

(b) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to a Market Participant in the PJM Region, title to the product that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and any further transactions associated with such products or further sale of such Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves in the markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, respectively, shall be transacted by the buyer under the bilateral contract. In no event shall the purchase and sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves between Market Participants under a bilateral contract constitute a transaction in PJM's markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, or otherwise construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.

(c) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves reported to and coordinated with the Office of the Interconnection under this Schedule shall use

all reasonable efforts, consistent with Good Utility Practice, to limit the amounts of such reported transactions to amounts reflecting the expected requirements for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves of the buyer pursuant to such bilateral contracts.

(d) All payments and related charges for the Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection. The LLC, PJM Settlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.

(e) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any purchases by the seller under the bilateral contract in the markets for Regulations, Synchronized Reserve, or Day-ahead Scheduling Reserves used to meet the bilateral contract seller's obligation to deliver Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the Interconnection shall (i) not accept any new eMarket reporting by the Market Participant and (ii) terminate all of the Market Participant's reporting of eMarkets schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the reported eMarkets schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection.

(f) Market Participants shall purchase Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves from PJM's markets for Regulation, Synchronized Reserve, Day-ahead Scheduling Reserves, in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason, with respect to all bilateral transactions that contemplate the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant.

1.7.20 Communication and Operating Requirements.

(a) Market Participants. Each Market Participant shall have, or shall arrange to have, its transactions in the PJM Interchange Energy Market subject to control by a Market Operations Center, with staffing and communications systems capable of real-time communication with the Office of the Interconnection during normal and Emergency conditions and of control of the Market Participant's relevant load or facilities sufficient to meet the requirements of the Market Participant's transactions with the PJM Interchange Energy Market, including but not limited to the following requirements as applicable.

- (b) Market Sellers selling from generation resources and/or Demand Resources within the PJM Region shall: report to the Office of the Interconnection sources of energy and Demand Resources available for operation; supply to the Office of the Interconnection all applicable Offer Data; report to the Office of the Interconnection generation resources that are self-scheduled; with respect to generation resources, report to the Office of the Interconnection bilateral sales transactions to buyers not within the PJM Region; confirm to the Office of the Interconnection bilateral sales to Market Buyers within the PJM Region; respond to the Office of the Interconnection's directives to start, shutdown or change output levels of generation units, or change scheduled voltages or reactive output levels of generation units, or reduce load from Demand Resources; continuously maintain all Offer Data concurrent with on-line operating information; and ensure that, where so equipped, generating equipment and Demand Resources are operated with control equipment functioning as specified in the PJM Manuals.
- (c) Market Sellers selling from generation resources outside the PJM Region shall: provide to the Office of the Interconnection all applicable Offer Data, including offers specifying amounts of energy available, hours of availability and prices of energy and other services; respond to Office of the Interconnection directives to schedule delivery or change delivery schedules; and communicate delivery schedules to the Market Seller's Control Area.
- (d) Market Participants that are Load Serving Entities or purchasing on behalf of Load Serving Entities shall: respond to Office of the Interconnection directives for load management steps; report to the Office of the Interconnection Generation Capacity Resources to satisfy capacity obligations that are available for pool operation; report to the Office of the Interconnection all bilateral purchase transactions; respond to other Office of the Interconnection directives such as those required during Emergency operation.
- (e) Market Participants that are not Load Serving Entities or purchasing on behalf of Load Serving Entities shall: provide to the Office of the Interconnection requests to purchase specified amounts of energy for each hour of the Operating Day during which it intends to purchase from the PJM Interchange Energy Market, along with Dispatch Rate levels above which it does not desire to purchase; respond to other Office of the Interconnection directives such as those required during Emergency operation.
- (f) Economic Load Response Participants are responsible for maintaining demand reduction information, including the amount and price at which demand may be reduced. The Economic Load Response Participant shall provide this information to the Office of the Interconnection by posting it on the Load Response Program Registration link of the PJM website as required by the PJM Manuals. The Economic Load Response Participant shall notify the Office of the Interconnection of a demand reduction concurrent with, or prior to, the beginning of such demand reduction in accordance with the PJM Manuals. In the event that an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer that would affect a relevant Customer Baseline Load as required by the PJM Manuals.

2.2 General.

The Office of the Interconnection shall determine the least cost security-constrained dispatch, which is the least costly means of serving load at different locations in the PJM Region based on actual operating conditions existing on the power grid (including transmission constraints on external coordinated flowgates to the extent provided by section 1.7.6) and on the prices at which Market Sellers have offered to supply energy and offers by Economic Load Response Participants to reduce demand that qualify to set Locational Marginal Prices in the PJM Interchange Energy Market. Locational Marginal Prices for the generation and load buses in the PJM Region, including interconnections with other Control Areas, will be calculated based on the actual economic dispatch and the prices of energy and demand reduction offers. The process for the determination of Locational Marginal Prices shall be as follows:

- (a) To determine actual operating conditions on the power grid in the PJM Region, the Office of the Interconnection shall use a computer model of the interconnected grid that uses available metered inputs regarding generator output, loads, and power flows to model remaining flows and conditions, producing a consistent representation of power flows on the network. The computer model employed for this purpose, referred to as the State Estimator program, is a standard industry tool and is described in Section 2.3 below. It will be used to obtain information regarding the output of generation supplying energy to the PJM Region, loads at buses in the PJM Region, transmission losses, and power flows on binding transmission constraints for use in the calculation of Locational Marginal Prices. Additional information used in the calculation, including Dispatch Rates and real time schedules for external transactions between PJM and other Control Areas and dispatch and pricing information from entities with whom PJM has executed a joint operating agreement, will be obtained from the Office of the Interconnection's dispatchers.
- (b) Using the prices at which energy is offered by Market Sellers and demand reductions are offered by Economic Load Response Participants to the PJM Interchange Energy Market, the Office of the Interconnection shall determine the offers of energy and demand reductions that will be considered in the calculation of Locational Marginal Prices. As described in Section 2.4 below, every qualified offer for demand reduction and of energy by a Market Seller from resources that are following economic dispatch instructions of the Office of the Interconnection will be utilized in the calculation of Locational Marginal Prices, including, without limitation, qualified offers from Economic Load Response Participants in either the Day-Ahead or Real-Time Energy Markets that satisfy the Net Benefits Test. Offers of demand reduction from Demand Resources in the Real-time Energy Market will not be eligible to set Locational Marginal Prices, unless metered directly by the Office of the Interconnection.
- (c) Based on the system conditions on the PJM power grid, determined as described in (a), and the eligible energy and demand reduction offers, determined as described in (b), the Office of the Interconnection shall determine the least costly means of obtaining energy to serve the next increment of load at each bus in the PJM Region, in the manner described in Section 2.5 below. The result of that calculation shall be a set of Locational Marginal Prices based on the system conditions at the time.

3.2 Market Buyers.

3.2.1 Spot Market Energy Charges.

(a) The Office of the Interconnection shall calculate System Energy Prices in the form of Day-ahead System Energy Prices and Real-time System Energy Prices for the PJM Region, in accordance with Section 2 of this Schedule.

(b) Market Buyers shall be charged for all load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) scheduled to be served from the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price.

(c) Generating Market Buyers shall be paid for all energy scheduled to be delivered to the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price.

(d) At the end of each hour during an Operating Day, the Office of the Interconnection shall calculate the total amount of net hourly PJM Interchange for each Market Buyer, including Generating Market Buyers, in accordance with the PJM Manuals. For Internal Market Buyers that are Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall include determination of the net energy flows from: (i) tie lines; (ii) any generation resource the output of which is controlled by the Market Buyer but delivered to it over another entity's Transmission Facilities; (iii) any generation resource the output of which is controlled by another entity but which is directly interconnected with the Market Buyer's transmission system; (iv) deliveries pursuant to bilateral energy sales; (v) receipts pursuant to bilateral energy purchases; and (vi) an adjustment to account for the day-ahead PJM Interchange, calculated as the difference between scheduled withdrawals and injections by that Market Buyer in the Day-ahead Energy Market. For External Market Buyers and Internal Market Buyers that are not Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall determine the energy scheduled hourly for delivery to the Market Buyer net of the amounts scheduled by the External Market Buyer in the Day-ahead Energy Market.

(e) An Internal Market Buyer shall be charged for Spot Market Energy purchases to the extent of its hourly net purchases from the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. An External Market Buyer shall be charged for its Spot Market Energy purchases based on the energy delivered to it, determined as specified in Section 3.2.1(d) above. The total charge shall be determined by the product of the hourly net amount of PJM Interchange Imports times the hourly Real-time System Energy Price for that Market Buyer.

(f) A Generating Market Buyer shall be paid as a Market Seller for sales of Spot Market Energy to the extent of its hourly net sales into the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. The total payment shall be determined by the product of the hourly net amount of PJM Interchange Exports times the hourly Real-time System Energy Price for that Market Seller.

3.2.2 Regulation.

(a) Each Internal Market Buyer that is a Load Serving Entity in a Regulation Zone shall have an hourly Regulation objective equal to its pro rata share of the Regulation requirements of such Regulation Zone for the hour, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Regulation Zone for the hour ("Regulation Obligation"). An Internal Market Buyer that does not meet its hourly Regulation obligation shall be charged for Regulation dispatched by the Office of the Interconnection to meet such obligation at the Regulation market-clearing price determined in accordance with subsection (c) of this Section, plus the amounts, if any, described in subsection (f) of this section.

(b) A Generating Market Buyer supplying Regulation in a Regulation Zone at the direction of the Office of the Interconnection in excess of its hourly Regulation obligation shall be credited for each increment of such Regulation at the higher of (i) the Regulation market-clearing price in such Regulation Zone or (ii) the sum of the regulation offer and the unit-specific opportunity cost of the generation resource supplying the increment of Regulation, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(c) The Regulation market-clearing price in each Regulation Zone shall be determined at a time to be determined by the Office of the Interconnection which shall be no earlier than the day before the Operating Day. The market-clearing price for each regulating hour shall be equal to the highest sum of a resource's Regulation offer plus its estimated unit-specific opportunity costs, determined as described in subsection (d) below from among the resources selected to provide Regulation. A resource's Regulation offer by any Market Seller that fails the three-pivotal supplier test set forth in section 3.3.2A.1 of this Schedule shall not exceed the cost of providing Regulation from such resource, plus twelve dollars, as determined pursuant to the formula in section 1.10.1A(e) of this Schedule.

(d) In determining the Regulation market-clearing price for each Regulation Zone, the estimated unit-specific opportunity costs of a generation resource offering to sell Regulation in each regulating hour shall be equal to the sum of the unit-specific opportunity costs (i) incurred during the hour in which the obligation is fulfilled, plus costs (ii) associated with uneconomic operation during the hour preceding the initial regulating hour ("preceding shoulder hour"), plus costs (iii) associated with uneconomic operation during the hour after the final regulating hour ("following shoulder hour").

The unit-specific opportunity costs incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the set point of the generation resource that is expected to be required in order to provide Regulation from the generation resource's expected output level if it had been dispatched in economic merit order times (ii) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource) in the PJM Interchange Energy Market.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the preceding shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the following shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the following shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market.

Estimated opportunity costs for Demand Resources to provide Regulation are zero.

(e) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Regulation in a Regulation Zone and that actively follows the Office of the Interconnection's Regulation signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Regulation, and for the percentage of the preceding shoulder hour and the following shoulder hour during which the Generating Market Buyer or Market Seller provided Regulation. The unit-specific opportunity cost incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's Regulation signals from the generation resource's expected output level if it had been dispatched in economic merit order times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the actual megawatt level of the resource when the actual megawatt level is within the tolerance defined in the PJM Manuals for the Regulation set point, or at the Regulation set point for the

resource when it is not within the corresponding tolerance) in the PJM Interchange Energy Market. Opportunity costs for Demand Resources to provide Regulation are zero.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the preceding shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the following shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the following shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the following shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(f) Any amounts credited for Regulation in an hour in excess of the Regulation market-clearing price in that hour shall be allocated and charged to each Internal Market Buyer in a Regulation Zone that does not meet its hourly Regulation obligation in proportion to its purchases of Regulation in such Regulation Zone in megawatt-hours during that hour.

3.2.2A Offer Price Caps.

3.2.2A.1 Applicability.

(a) Each hour, the Office of the Interconnection shall conduct a three-pivotal supplier test as described in this section. Regulation offers from Market Sellers that fail the three-pivotal

supplier test shall be capped in the hour in which they failed the test at their cost based offers as determined pursuant to section 1.10.1A(e) of this Schedule. A Regulation supplier fails the three-pivotal supplier test in any hour in which such Regulation supplier and the two largest other Regulation suppliers are jointly pivotal.

(b) For the purposes of conducting the three-pivotal supplier test pursuant to this section, the following applies:

- (i) The three-pivotal supplier test will include in the definition of available supply all offers from resources capable of satisfying the Regulation requirement of the PJM Region for which the cost-based offer plus any eligible opportunity costs is no greater than 150 percent of the clearing price that would be calculated if all offers were limited to cost (plus eligible opportunity costs).
- (ii) The three-pivotal supplier test will apply on a Regulation supplier basis (i.e. not a resource by resource basis) and only the Regulation suppliers that fail the three-pivotal supplier test will have their Regulation offers capped. A Regulation supplier for the purposes of this section includes corporate affiliates. Regulation from resources controlled by a Regulation supplier or its affiliates, whether by contract with unaffiliated third parties or otherwise, will be included as Regulation of that Regulation supplier. Regulation provided by resources owned by a Regulation supplier but controlled by an unaffiliated third party, whether by contract or otherwise, will be included as Regulation of that third party.

3.2.3 Operating Reserves.

(a) A Market Seller's pool-scheduled resources capable of providing Operating Reserves shall be credited as specified below based on the prices offered for the operation of such resource, provided that the resource was available for the entire time specified in the Offer Data for such resource. To the extent that Section 3.2.A.01 of Schedule 1 of this Agreement does not meet the Day-ahead Scheduling Reserves Requirement, the Office of the Interconnection shall schedule additional Operating Reserves pursuant to Section 1.7.17 and 1.10 of Schedule 1 of this Agreement. In addition the Office of the Interconnection shall schedule Operating Reserves pursuant to those sections to satisfy any unforeseen Operating Reserve requirements that are not reflected in the Day-ahead Scheduling Reserves Requirement.

(b) The following determination shall be made for each pool-scheduled resource that is scheduled in the Day-ahead Energy Market: the total offered price for start-up and no-load fees and energy, determined on the basis of the resource's scheduled output, shall be compared to the total value of that resource's energy – as determined by the Day-ahead Energy Market and the Day-ahead Prices applicable to the relevant generation bus in the Day-ahead Energy Market. Except as provided in Section 3.2.3(n), if the total offered price summed over all hours exceeds the total value summed over all hours, the difference shall be credited to the Market Seller. The Office of the Interconnection shall apply any balancing Operating Reserve credits allocated

pursuant to this Section 3.2.3(b) to real-time deviations from day-ahead schedules or real-time load share plus exports, pursuant to Section 3.2.3(p), depending on whether the balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

- (i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve credits shall be allocated based on the reason the resource was scheduled according to the following provisions:

- (A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve credits, identified as RA Credits for Deviations, shall be allocated to real-time deviations from day-ahead schedules.

- (B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve credits, identified as RA Credits for Reliability, shall be allocated according to ratio share of real time load plus export transactions.

- (C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve credits shall be segmented and separately allocated pursuant to subsections 3.2.3(b)(i)(A) or 3.2.3(b)(i)(B) hereof. Balancing Operating Reserve credits for such resources will be identified in the same manner as units committed during the reliability analysis pursuant to subsections 3.2.3(b)(i)(A) and 3.2.3(b)(i)(B) hereof.

- (ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve credits shall be allocated according to the following provisions:

- (A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve credits, identified as RT Credits for Reliability, shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, credits will be applied pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the

resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the credits for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category (RT Credits for Reliability or RT Credits for Deviations) as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(b)(ii)(A) hereof to operate in real-time during an Operating Day, the associated balancing Operating Reserve credits, identified as RT Credits for Deviations, shall be allocated according to real-time deviations from day-ahead schedules.

(iii) PJM shall post on its Web site the aggregate amount of MWs committed that meet the criteria referenced in subsections (b)(i) and (b)(ii) hereof.

(c) The sum of the foregoing credits calculated in accordance with Section 3.2.3(b) plus any unallocated charges from Section 3.2.3(h) and 5.1.7, and any shortfalls paid pursuant to the Market Settlement provision of the Day-ahead Economic Load Response Program shall be the cost of Operating Reserves in the Day-ahead Energy Market.

(d) The cost of Operating Reserves in the Day-ahead Energy Market shall be allocated and charged to each Market Participant in proportion to the sum of its (i) scheduled load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) and accepted Decrement Bids in the Day-ahead Energy Market in megawatt-hours for that Operating Day; and (ii) scheduled energy sales in the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours for that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such area pursuant to Section 1.12.

(e) At the end of each Operating Day, the following determination shall be made for each synchronized pool-scheduled resource of each Market Seller that operates as requested by the Office of the Interconnection and that is not committed solely for the purpose of providing Synchronized Reserve: For each calendar day, pool-scheduled resources in the Real-time Energy Market shall be made whole for each of the following segments: 1) the greater of their day-ahead schedules or minimum run time (minimum down time for Demand Resources); and 2) any block of hours the resource operates at PJM's direction in excess of the greater of its day-ahead schedule or minimum run time (minimum down time for Demand Resources). For each calendar day, and for each synchronized start of a generation resource or PJM-dispatched economic load reduction, there will be a maximum of two segments for each resource. Segment 1 will be the greater of the day-ahead schedule and minimum run time (minimum down time for Demand Resources) and Segment 2 will include the remainder of the contiguous hours when the resource is operating at the direction of the Office of the Interconnection, provided that a segment is limited to the Operating Day in which it commenced and cannot include any part of the following Operating Day.

Credits received pursuant to this section shall be equal to the positive difference between a resource's total offered price for start-up (shutdown costs for Demand Resources) and no-load fees and energy, determined on the basis of the resource's scheduled output, and the total value of the resource's energy as determined by the Real-time Energy Market and the real-time LMP(s) applicable to the relevant generation bus in the Real-time Energy Market. The foregoing notwithstanding, credits for segment 2 shall exclude start up (shutdown costs for Demand Resources) costs for generation resources.

Except as provided in Section 3.2.3(m), if the total offered price exceeds the total value, the difference less any credit as determined pursuant to Section 3.2.3(b) plus the resource's opportunity cost and less any amounts credited for Synchronized Reserve in excess of the Synchronized Reserve offer plus the resource's opportunity cost and less any amounts credited for providing Reactive Services as specified in Section 3.2.3B, and less any amounts for Day-ahead Scheduling Reserve in excess of the Day-ahead Scheduling Reserve offer plus the resource's opportunity cost, shall be credited to the Market Seller.

Synchronized Reserve and Day-ahead Scheduling Reserve credits applied against Operating Reserve credits pursuant to this section shall be netted against the Operating Reserve credits earned in the corresponding hour(s) in which the Synchronized Reserve and Day-ahead Scheduling Reserve credits accrued, provided that for condensing combustion turbines, Synchronized Reserve credits will be netted against the total Operating Reserve credits accrued during each period the unit operates in condensing and generation mode for one or more contiguous hours.

(f) A Market Seller's steam-electric generating unit or combined cycle unit operating in combined cycle mode that is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is reduced or suspended at the request of the Office of the Interconnection due to a transmission constraint or other reliability issue, and for which the hourly integrated, real-time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall be credited hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$, where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended, determined according to the real-time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer

associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(f-1) A Market Seller's combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

- (i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as directed by the PJM dispatcher), then the Market Seller shall be credited in a manner consistent with that described above for a steam unit or combined cycle unit operating in combined cycle mode.
- (ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

$URTLMP$ equals the real time LMP at the unit's bus;

$UDALMP$ equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit, determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(f-2) A Market Seller's hydroelectric resource that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is altered at the request of the Office of the Interconnection from the schedule submitted by the owner, due to a transmission constraint or other reliability issue, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(f-3) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for opportunity cost associated with following PJM dispatch instructions and reducing or suspending a unit's output due to a transmission constraint or other reliability issue, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of opportunity cost compensation, the Office of the Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit disagrees with the modified amount of opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(g) The sum of the foregoing credits, plus any cancellation fees paid in accordance with Section 1.10.2(d), such cancellation fees to be applied to the Operating Day for which the unit was scheduled, plus any shortfalls paid pursuant to the Market Settlement provision of the real-time Economic Load Response Program, less any payments received from another Control Area for Operating Reserves, plus any redispatch costs incurred in accordance with section 10(a) of this Schedule, shall be the cost of Operating Reserves for the Real-time Energy Market in each Operating Day.

(h) The cost of Operating Reserves for the Real-time Energy Market for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of the absolute values of its (i) load deviations (net of operating Behind The Meter Generation) from the Day-ahead Energy Market in megawatt-hours during that Operating Day; (ii) generation deviations (not including deviations in Behind The Meter Generation) from the Day-ahead Energy Market for non-dispatchable generation resources, including External Resources, in megawatt-hours during the Operating Day; (iii) deviations from the Day-ahead Energy Market for bilateral transactions from outside the PJM Region for delivery within such region in megawatt-hours during the Operating Day, except as noted below and in the PJM Manuals; and (iv) deviations of energy sales from the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such region pursuant to Section 1.12.

Deviations that occur within a single Zone shall be associated with the Eastern or Western Region, as defined in Section 3.2.3(q) of this Schedule, and shall be subject to the regional balancing Operating Reserve rate determined in accordance with Section 3.2.3(q). Deviations at interfaces and hubs shall be associated with the Eastern or Western Region if all the busses that define all interfaces or all hubs are located in the region. If deviations at interfaces and hubs are associated with the Eastern or Western region, they shall be subject to the regional balancing Operating Reserve rate. Demand and supply deviations shall be based on total activity in a Zone, including all aggregates and hubs defined by busses that are wholly contained within the same Zone.

The foregoing notwithstanding, netting deviations shall be allowed in accordance with the following provisions:

- (i) Generation resources with multiple units located at a single bus shall be able to offset deviations in accordance with the PJM Manuals to determine the net deviation MW at the relevant bus.
- (ii) Demand deviations will be assessed by comparing all day-ahead demand transactions at a single transmission zone, hub, or interface against the real-time demand transactions at that same transmission zone, hub, or interface; except that the positive values of demand deviations, as set forth in the PJM Manuals, will not be assessed Operating Reserve charges in the event of an Operating Reserve shortage in real-time or where PJM initiates the request for load reductions in real-time in order to avoid an Operating Reserve shortage as described in this Schedule, Section 6A, Scarcity Pricing.
- (iii) Supply deviations will be assessed by comparing all day-ahead transactions at a single transmission zone, hub, or interface against the real-time transactions at that same transmission zone, hub, or interface.

(i) At the end of each Operating Day, Market Sellers shall be credited on the basis of their offered prices for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, as well as the credits calculated as specified in Section 3.2.3(b) for those generators committed solely for the purpose of providing synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, at the request of the Office of the Interconnection.

(j) The sum of the foregoing credits as specified in Section 3.2.3(i) shall be the cost of Operating Reserves for synchronous condensing for the PJM Region for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for the Operating Day and shall be separately determined for each Control Zone of the PJM Region based on the Control Zone to which the resource was synchronized to provide synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation.

(k) The cost of Operating Reserves for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of its (i) deliveries of energy to load (net of operating Behind The Meter Generation, but not to be less than zero) in the PJM Region, served under Network Transmission Service, in megawatt-hours during that Operating Day; and (ii) deliveries of energy sales from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such Control Zone pursuant to Section 1.12, as compared to the sum of all such deliveries for all Market Participants.

(l) For any Operating Day in either, as applicable, the Day-ahead Energy Market or the Real-time Energy Market for which, for all or any part of such Operating Day, the Office of the Interconnection: (i) declares a Maximum Generation Emergency; (ii) issues an alert that a Maximum Generation Emergency may be declared (“Maximum Generation Emergency Alert”); or (iii) schedules units based on the anticipation of a Maximum Generation Emergency or a Maximum Generation Emergency Alert, the Operating Reserves credit otherwise provided by Section 3.2.3.(b) or Section 3.2.3(e) in connection with marked-based offers shall be limited as provided in subsections (n) or (m), respectively. The Office of the Interconnection shall provide timely notice on its internet site of the commencement and termination of any of the actions described in subsection (i), (ii), or (iii) of this subsection (l) (collectively referred to as “MaxGen Conditions”). Following the posting of notice of the commencement of a MaxGen Condition, a Market Seller may elect to submit a cost-based offer in accordance with Schedule 2 of the Operating Agreement, in which case subsections (m) and (n) shall not apply to such offer; provided, however, that such offer must be submitted in accordance with the deadlines in Section 1.10 for the submission of offers in the Day-ahead Energy Market or Real-time Energy Market, as applicable. Submission of a cost-based offer under such conditions shall not be precluded by Section 1.9.7(b); provided, however, that the Market Seller must return to compliance with Section 1.9.7(b) when it submits its bid for the first Operating Day after termination of the MaxGen Condition.

(m) For the Real-time Energy Market, if the Effective Offer Price (as defined below) for a market-based offer is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. For purposes of this subsection (m), the Effective Offer Price shall be the amount that, absent subsections (l) and (m), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(e) plus the Real-time Energy Market revenues for the hours that the offer is economic divided by the megawatt hours of energy provided during the hours that the offer is economic. The hours that the offer is economic shall be: (i) the hours that the offer price for energy is less than or equal to the Real-time Price for the relevant generation bus, (ii) the hours in which the offer for energy is greater than Locational Marginal Price and the unit is operated at the direction of the Office of the Interconnection that are in addition to any hours required due to the minimum run time or other operating constraint of the unit, and (iii) for any unit with a minimum run time of one hour or less and with more than one start available per day, any hours the unit operated at the direction of the Office of the Interconnection.

(n) For the Day-ahead Energy Market, if notice of a MaxGen Condition is provided prior to 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. If notice of a MaxGen Condition is provided after 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. If the Effective Offer Price is less than or equal to \$1,000/MWh, regardless of when notice of a MaxGen Condition is provided, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. For purposes of this subsection (n), the Effective Offer

Price shall be the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day divided by the megawatt hours of energy offered during the Specified Hours, plus the offer for energy during such hours. The Specified Hours shall be the lesser of: (1) the minimum run hours stated by the Market Seller in its Offer Data; and (2) either (i) for steam-electric generating units and for combined-cycle units when such units are operating in combined-cycle mode, the six consecutive hours of highest Day-ahead Price during such Operating Day when such units are running or (ii) for combustion turbine units and for combined-cycle units when such units are operating in combustion turbine mode, the two consecutive hours of highest Day-ahead Price during such Operating Day when such units are running. Notwithstanding any other provision in this subsection, the total compensation to a Market Seller on any Operating Day that includes a MaxGen Condition shall not exceed \$1,000/MWh during the Specified Hours, where such total compensation in each such hour is defined as the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(b) divided by the Specified Hours, plus the Day-ahead Price for such hour, and no Operating Reserves payments shall be made for any other hour of such Operating Day. If a unit operates in real time at the direction of the office of the Interconnection consistently with its day-ahead clearing, then subsection (m) does not apply.

(o) Dispatchable pool-scheduled generation resources and dispatchable self-scheduled generation resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Pool-scheduled generation resources and dispatchable self-scheduled generation resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations in accordance with the calculations described in the PJM Manuals. Ramp-limited desired MW values shall be used to determine generation resource real-time deviations from the resource's day-ahead schedules.

The Office of the Interconnection shall calculate a ramp-limited desired MW value for generation resources where the economic minimum and economic maximum are at least as far apart in real-time as they are in day-ahead according to the following parameters:

- (i) real-time economic minimum $\leq$ 105% of day-ahead economic minimum or day-ahead economic minimum plus 5 MW, whichever is greater.
- (ii) real-time economic maximum $\geq$ 95% day-ahead economic maximum or day-ahead economic maximum minus 5 MW, whichever is lower.

The ramp-limited desired MW value for a generation resource shall be equal to:

$$\text{Ramp\_Request}_t = \frac{(\text{UDS}_{\text{target}}_{t-1} - \text{AOutput}_{t-1})}{(\text{UDSLA}_{\text{time}}_{t-1})}$$

$$\text{RL\_Desired}_t = \text{AOutput}_{t-1} + \left(\text{Ramp\_Request}_t * \text{Case\_Eff\_time}_{t-1} \right)$$

where:

1. $\text{UDS}_{\text{target}}$ = UDS basepoint for the previous UDS case

2. $A_{Output} = \text{Unit's output at case solution time}$
3. $UDSLA_{time} = \text{UDS look ahead time}$
4. $Case\_Eff\_time = \text{Time between base point changes}$
5. $RL\_Desired = \text{Ramp-limited desired MW}$

To determine if a generation resource is following dispatch the Office of the Interconnection shall determine the unit's MW off dispatch and % off dispatch by using the lesser of the difference between the actual output and the UDS Basepoint or the actual output and ramp-limited desired MW value. The % off dispatch and MW off dispatch will be a time-weighted average over the course of an hour.

A pool-scheduled or dispatchable self-scheduled resource is considered to be following dispatch if its actual output is between its ramp-limited desired MW value and UDS Basepoint, or if its % off dispatch is ≤ 10 , or its hourly integrated Real-time MWh is within 5% or 5 MW (whichever is greater) of the hourly integrated ramp-limited desired MW. A self-scheduled generator must also be dispatched above economic minimum. The degree of deviations for resources that are not following dispatch shall be determined in accordance with the following provisions:

- A dispatchable self-scheduled resource that is not dispatched above economic minimum shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – Day-Ahead MWh.
- A resource that is dispatchable day-ahead but is Fixed Gen in real-time shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – UDS LMP Desired MW.
- Pool-scheduled generators that are not following dispatch shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW.
- If a resource's real-time economic minimum is greater than its day-ahead economic minimum by 5% or 5 MW, whichever is greater, or its real-time economic maximum is less than its Day Ahead economic maximum by 5% or 5 MW, whichever is lower, and UDS LMP Desired MWh for the hour is either below the real time economic minimum or above the real time economic maximum, then balancing Operating Reserve deviations for the resource shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch and its % Off Dispatch is $\leq 20\%$, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW. If deviation value is within 5% or 5 MW (whichever is greater) of Ramp-Limited Desired MW, balancing Operating Reserve deviations shall not be assessed.

- If a resource is not following dispatch and its % off Dispatch is > 20%, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch, and the resource has tripped, for the hour the resource tripped and the hours it remains offline throughout its day-ahead schedule balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – Day-Ahead MWh.
- For resources that are not dispatchable in both the Day-Ahead and Real-time Energy Markets balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh and Day-Ahead MWh.

(o-1) Dispatchable economic load reduction resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Economic load reduction resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations as described in this subsection and as further specified in the PJM Manuals.

The Desired MW quantity for such resources for each hour shall be the hourly integrated MW quantity to which the load reduction resource was dispatched for each hour (where the hourly integrated value is the average of the dispatched values as determined by the Office of the Interconnection for the resource for each hour).

If the actual reduction quantity for the load reduction resource for a given hour deviates by no more than 20% above or below the Desired MW quantity, then no balancing Operating Reserve deviation will accrue for that hour. If the actual reduction quantity for the load reduction resource for a given hour is outside the 20% bandwidth, the balancing Operating Reserve deviations will accrue for that hour in the amount of the absolute value of (Desired MW – actual reduction quantity). For those hours where the actual reduction quantity is within the 20% bandwidth specified above, the load reduction resource will be eligible to be made whole for the total value of its offer as defined in section 3.3A of this Appendix. Hours for which the actual reduction quantity is outside the 20% bandwidth will not be eligible for the make-whole payment. If at least one hour is not eligible for make-whole payment based on the 20% criteria, then the resource will also not be made whole for its shutdown cost.

(p) The Office of the Interconnection shall allocate the charges assessed pursuant to Section 3.2.3(h) of Schedule 1 of this Agreement to real-time deviations from day-ahead schedules or real-time load share plus exports depending on whether the underlying balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

- (i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve charges shall be allocated based on the reason the resource was scheduled according to the following provisions:

(A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve charges shall be allocated to real-time deviations from day-ahead schedules.

(B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve charges shall be allocated according to ratio share of real time load plus export transactions.

(C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated pursuant to (A) or (B) above.

(ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to the following provisions:

(A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, charges will be assessed pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the charges for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(h)(ii)(A) of Schedule 1 of this Agreement to operate in real-time during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to real-time deviations from day-ahead schedules.

(q) The Office of the Interconnection shall determine regional balancing Operating Reserve rates for the Western and Eastern Regions of the PJM Region. For the purposes of this section, the Western Region shall be the AEP, APS, ComEd, Duquesne, Dayton ATSI transmission Zones, and the Eastern Region shall be the AEC, BGE, Dominion, PENELEC, PEPCO, ME, PPL, JCPL, PECO, DPL, PSEG, RE transmission Zones. The regional balancing Operating Reserve rates shall be determined in accordance with the following provisions:

(i) The Office of the Interconnection shall calculate regional adder rates for the Eastern and Western Regions. Regional adder rates shall be equal to the total balancing Operating Reserve credits paid to generators for transmission constraints that occur on transmission system capacity equal to or less than 345kv. The regional adder rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are designated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(ii) The Office of the Interconnection shall calculate RTO balancing Operating Reserve rates. RTO balancing Operating Reserve rates shall be equal to balancing Operating Reserve credits in excess of the regional adder rates calculated pursuant to Section 3.2.3(q)(i) of Schedule 1 of this Agreement. The RTO balancing Operating Reserve rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are allocated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(iii) Reliability and deviation regional balancing Operating Reserve rates shall be determined by summing the relevant RTO balancing Operating Reserve rates and regional adder rates.

(iv) If the Eastern and/or Western Regions do not have regional adder rates, the relevant regional balancing Operating Reserve rate shall be the reliability and/or deviation RTO balancing Operating Reserve rate.

3.2.3A Synchronized Reserve.

(a) Each Internal Market Buyer that is a Load Serving Entity shall have an obligation for hourly Synchronized Reserve equal to its pro rata share of Synchronized Reserve requirements for the hour for each Synchronized Reserve Zone of the PJM Region, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Synchronized Reserve Zone, for the hour ("Synchronized Reserve Obligation"), less any amount obtained from condensers associated with provision of Reactive Services as described in section 3.2.3B(i) and any amount obtained from condensers associated with post-contingency operations, as described in section 3.2.3C(b). An Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation shall be charged for the Synchronized Reserve dispatched by the Office of the Interconnection to meet such obligation at the Synchronized Reserve Market Clearing Price determined in accordance with subsection (d) of this section, plus the amounts if any, described in subsections (g), (h) and (i) of this section.

(b) A Generating Market Buyer supplying Synchronized Reserve at the direction of the Office of the Interconnection, in excess of its hourly Synchronized Reserve Obligation, shall be credited as follows:

- i) Credits for Synchronized Reserve provided by generation units that are then subject to the energy dispatch signals and instructions of the Office of the Interconnection and that increase their current output or Demand Resources that reduce their load in response to a Synchronized Reserve Event (“Tier 1 Synchronized Reserve”) shall be at the Synchronized Energy Premium Price.
- ii) Credits for Synchronized Reserve provided by generation resources that are synchronized to the grid but, at the direction of the Office of the Interconnection, are operating at a point that deviates from the Office of the Interconnection energy dispatch signals and instructions (“Tier 2 Synchronized Reserve”) shall be the higher of (i) the Synchronized Reserve Market Clearing Price or (ii) the sum of (A) the Synchronized Reserve offer, and (B) the specific opportunity cost of the generation resource supplying the increment of Synchronized Reserve, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.
- iii) Credits for Synchronized Reserve provided by Demand Resources that are synchronized to the grid and accept the obligation to reduce load in response to a Synchronized Reserve Event initiated by the Office of the Interconnection shall be the sum of (i) the higher of (A) the synchronized Reserve offer or (B) the Synchronized Reserve Market Clearing Price and (ii) if a Synchronized Reserve Event is actually initiated by the Office of the Interconnection and the Demand Resource reduced its load in response to the event, the fixed costs associated with achieving the load reduction, as specified in the PJM Manuals.

(c) The Synchronized Reserve Energy Premium Price is the average of the five-minute Locational Marginal Prices calculated during the Synchronized Reserve Event plus an adder in an amount to be determined periodically by the Office of the Interconnection not less than fifty dollars and not to exceed one hundred dollars per megawatt hour.

(d) The Synchronized Reserve Market Clearing Price shall be determined for each Synchronized Reserve Zone by the Office of the Interconnection prior to the operating hour and such market-clearing price shall be equal to, from among the generation resources or Demand Resources selected to provide Synchronized Reserve for such Synchronized Reserve Zone, the highest sum of either (i) a generation resource’s Synchronized Reserve offer and opportunity cost or (ii) a demand response resource’s Synchronized Reserve offer.

(e) In determining the Synchronized Reserve Market Clearing Price, the estimated unit-specific opportunity cost for a generation resource shall be equal to the sum of (i) the product of

(A) the expected Locational Marginal Price at the generation bus for the generation resource times (B) the megawatts of energy used to provide Synchronized Reserve submitted as part of the Synchronized Reserve offer and (ii) the product of (A) the deviation of the set point of the generation resource that is expected to be required in order to provide Synchronized Reserve from the generation resource's expected output level if it had been dispatched in economic merit order times (B) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(f) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Tier 2 Synchronized Reserve and that actively follows the Office of the Interconnection's signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Tier 2 Synchronized Reserve and shall be equal to the sum of (i) the product of (A) the megawatts of energy used by the resource to provide Synchronized Reserve as submitted as part of the generation resource's Synchronized Reserve offer times (B) the Locational Marginal Price at the generation bus of the generation resource, and (ii) the product of (A) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's signals and instructions from the generation resource's expected output level if it had been dispatched in economic merit order, times (B) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the generation resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(g) Charges for Tier 1 Synchronized Reserve will be allocated in proportion to the amount of Tier 1 Synchronized Reserve applied to each Synchronized Reserve Obligation. In the event Tier 1 Synchronized Reserve is provided by a Market Seller in excess of that Market Seller's Synchronized Reserve Obligation, the remainder of the Tier 1 Synchronized Reserve that is not utilized to fulfill the Seller's obligation will be allocated proportionately among all other Synchronized Reserve Obligations.

(h) Any amounts credited for Tier 2 Synchronized Reserve in an hour in excess of the Synchronized Reserve Market Clearing Price in that hour shall be allocated and charged to each Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation in proportion to its purchases of Synchronized Reserve in megawatt-hours during that hour.

(i) In the event the Office of the Interconnection needs to assign more Tier 2 Synchronized Reserve during an hour than was estimated as needed at the time the Synchronized Reserve Market Clearing Price was calculated for that hour due to a reduction in available Tier 1 Synchronized Reserve, the costs of the excess Tier 2 Synchronized Reserve shall be allocated and charged to those providers of Tier 1 Synchronized Reserve whose available Tier 1 Synchronized Reserve was reduced from the needed amount estimated during the Synchronized

Reserve Market Clearing Price calculation, in proportion to the amount of the reduction in Tier 1 Synchronized Reserve availability.

(j) In the event a generation resource or Demand Resource that either has been assigned by the Office of the Interconnection or self-scheduled by the owner to provide Tier 2 Synchronized Reserve fails to provide the assigned or self-scheduled amount of Synchronized Reserve in response to an actual Synchronized Reserve Event, the owner of the resource shall incur an additional Synchronized Reserve Obligation in the amount of the shortfall for a period of three consecutive days with the same peak classification (on-peak or off-peak) as the day of the Synchronized Reserve Event at least three business days following the Synchronized Reserve Event. The overall Synchronized Reserve requirement for each Synchronized Reserve Zone of the PJM Region on which the Synchronized Reserve Obligations, except for the additional obligations set forth in this section, are based shall be reduced by the amount of this shortfall for the applicable three-day period.

(k) The magnitude of response to a Synchronized Reserve Event by a generation resource or a Demand Resource, except for Batch Load Demand Resources covered by section 3.2.3A(l), is the difference between the generation resource's output or the Demand Resource's consumption at the start of the event and its output or consumption ten minutes after the start of the event. In order to allow for small fluctuations and possible telemetry delays, generation resource output or Demand Resource consumption at the start of the event is defined as the lowest telemetered generator resource output or greatest Demand Resource consumption between one minute prior to and one minute following the start of the event. Similarly, a generation resource's output or a Demand Resource's consumption 10 minutes after the event is defined as the greatest generator resource output or lowest Demand Resource consumption achieved between 9 and 11 minutes after the start of the event. The response actually credited to a generation resource will be reduced by the amount the megawatt output of the generation resource falls below the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter. The response actually credited to a Demand Resource will be reduced by the amount the megawatt consumption of the Demand Resource exceeds the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter.

(l) The magnitude of response by a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the start of a Synchronized Reserve Event shall be the difference between (i) the Batch Load Demand Resource's consumption at the end of the Synchronized Reserve Event and (ii) the Batch Load Demand Resource's consumption during the minute within the ten minutes after the end of the Synchronized Reserve Event in which the Batch Load Demand Resource's consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the magnitude of the response shall be zero if, when the Synchronized Reserve Event commences, the scheduled off-cycle stage of the production cycle is greater than ten minutes.

3.2.3A.01 Day-ahead Scheduling Reserves.

(a) The Office of the Interconnection shall satisfy the Day-ahead Scheduling Reserves Requirement by procuring Day-ahead Scheduling Reserves in the Day-ahead Scheduling Reserves Market from Day-ahead Scheduling Reserves Resources, provided that Demand Resources shall be limited to providing the lesser of any limit established by the Reliability First Corporation or SERC, as applicable, or twenty-five percent of the total Day-ahead Scheduling Reserves Requirement. Day-ahead Scheduling Reserves Resources that clear in the Day-ahead Scheduling Reserves Market shall receive a Day-ahead Scheduling Reserves schedule from the Office of the Interconnection for the relevant Operating Day. PJMSettlement shall be the Counterparty to the purchases and sales of Day-ahead Scheduling Reserves in the PJM Interchange Energy Market; provided that PJMSettlement shall not be a contracting party to bilateral transactions between Market Participants or with respect to a self-schedule or self-supply of generation resources by a Market Buyer to satisfy its Day-ahead Scheduling Reserves Requirement.

(b) A Day-ahead Scheduling Reserves Resource that receives a Day-ahead Scheduling Reserves schedule pursuant to subsection (a) of this section shall be paid the hourly Day-ahead Scheduling Reserves Market clearing price for the MW obligation in each hour of the schedule, subject to meeting the requirements of subsection (c) of this section.

(c) To be eligible for payment pursuant to subsection (b) of this section, Day-ahead Scheduling Reserves Resources shall comply with the following provisions:

- (i) Generation resources with a start time greater than thirty minutes are required to be synchronized and operating at the direction of the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule and shall have a dispatchable range equal to or greater than the Day-ahead Scheduling Reserves schedule.
- (ii) Generation resources and Demand Resources with start times or shut-down times, respectively, equal to or less than 30 minutes are required to respond to dispatch directives from the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule. To meet this requirement the resource shall be required to start or shut down within the specified notification time plus its start or shut down time, provided that such time shall be less than thirty minutes.
- (iii) Demand Resources with a Day-ahead Scheduling Reserves schedule shall be credited based on the difference between the resource's MW consumption at the time the resource is directed by the Office of the Interconnection to reduce its load (starting MW usage) and the resource's MW consumption at the time when the Demand Resource is no longer dispatched by PJM (ending MW usage). For the purposes of this subsection, a resource's starting MW usage shall be the greatest telemetered consumption between one minute prior to and one minute following the issuance of a dispatch instruction from the Office of the Interconnection, and a resource's ending MW usage shall be the lowest

consumption between one minute before and one minute after a dispatch instruction from the Office of the Interconnection that is no longer necessary to reduce.

- (iv) Notwithstanding subsection (iii) above, the credit for a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the time the resource is directed by the Office of the Interconnection to reduce its load shall be the difference between (i) the “ending MW usage” (as defined above) and (ii) the Batch Load Demand Resource’s consumption during the minute within the ten minutes after the time of the “ending MW usage” in which the Batch Load Demand Resource’s consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the credit shall be zero if, at the time the resource is directed by the Office of the Interconnection to reduce its load, the scheduled off-cycle stage of the production cycle is greater than the timeframe for which the resource was dispatched by PJM.

Resources that do not comply with the provisions of this subsection (c) shall not be eligible to receive credits pursuant to subsection (b) of this section.

(d) The cost of credits allocated to Day-ahead Scheduling Reserves Resources pursuant to this section shall be charged to Load-Serving Entities in the PJM Region based on load ratio share (net of operating Behind The Meter Generation, but not to be less than zero), provided that a Load-Serving Entity may satisfy its Day-ahead Scheduling Reserves obligation, which is equal to the Day-ahead Scheduling Reserves Requirement multiplied by the Load-Serving Entity’s load ratio share for the PJM Region, through one or any combination of the following: 1) the Day-ahead Scheduling Reserves Market; 2) and bilateral arrangements. The Day-ahead Scheduling Reserve charges allocated pursuant to this section shall reflect any portion of a Load-Serving Entity’s Day-ahead Scheduling Reserves obligation that is met by bilateral arrangement(s).

(e) If the Day-ahead Scheduling Reserves Requirement is not satisfied through the operation of subsection (a) of this section, any additional Operating Reserves required to meet the requirement shall be scheduled by the Office of the Interconnection pursuant to Section 3.2.3 of Schedule 1 of this Agreement.

3.2.3B Reactive Services.

(a) A Market Seller providing Reactive Services at the direction of the Office of the Interconnection shall be credited as specified below for the operation of its resource. These provisions are intended to provide payments to generating units when the LMP dispatch algorithms would not result in the dispatch needed for the required reactive service. LMP will be used to compensate generators that are subject to redispatch for reactive transfer limits.

(b) At the end of each Operating Day, where the active energy output of a Market Seller's resource is reduced or suspended at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region, the Market Seller shall be credited according to Sections 3.2.3B(c) & 3.2.3B(d).

(c) A Market Seller providing Reactive Services from either a steam-electric generating unit or combined cycle unit operating in combined cycle mode, where such unit is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override) shall be compensated for lost opportunity cost by receiving a credit hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$

where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended determined according to the real time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(d) A Market Seller providing Reactive Services from either a combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

(i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection as directed by the PJM dispatcher, then the Market Seller shall be credited in a manner consistent with that described above in

Section 3.2.3B(c) for a steam unit or a combined cycle unit operating in combined cycle mode.

(ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

URTLMP equals the real time LMP at the unit's bus;

UDALMP equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(e) At the end of each Operating Day, where the active energy output of a Market Seller's unit is increased at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region and the offered price of the energy is above the real-time LMP at the unit's bus, the Market Seller shall be credited according to Section 3.2.3B(f).

(f) A Market Seller providing Reactive Services from either a steam-electric generating unit, combined cycle unit or combustion turbine unit, where such unit is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is lower than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall receive a credit hourly in an amount equal to $\{(AG - LMPDMW) \times (UB - URTLMP)\}$ where:

AG equals the actual hourly integrated output of the unit;

LMPDMW equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

UB equals the unit offer for that unit for which output is increased, determined according to the real time scheduled offer curve on which the unit was operating;

URTLMP equals the real time LMP at the unit's bus; and

where UB - URTLMP shall not be negative.

(g) A Market Seller providing Reactive Services from a hydroelectric resource where such resource is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the output of such resource is altered from the schedule submitted by the Market Seller for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(h) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for lost opportunity cost associated with following the Office of the Interconnection's dispatch instructions to reduce or suspend a unit's output for the purpose of maintaining reactive reliability, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of such alternate lost opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of alternate lost opportunity cost compensation, the Office of Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit disagrees with the modified amount of alternate lost opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(i) The amount of Synchronized Reserve provided by generating units maintaining reactive reliability shall be counted as Synchronized Reserve satisfying the overall PJM Synchronized Reserve requirements. Operators of these generating units shall be notified of such provision, and to the extent a generating unit's operator indicates that the generation unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated to provide Reactive Services also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generating unit provided synchronous condensing multiplied by the amount of Synchronized reserve provided by the synchronous condenser or (ii) the sum of (A) the generating unit's hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of MW energy usage for providing synchronous condensing multiplied by the real time LMP at the generation unit's bus, (C) the generation unit's startup-cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generation resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated to provide Reactive Services was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generation unit's cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are

located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to subsection (l) below.

(j) A Market Seller's pool scheduled steam-electric generating unit or combined cycle unit operating in combined cycle mode, that is not committed to operate in the Day-ahead Market, but that is directed by the Office of Interconnection to operate solely for the purpose of maintaining reactive reliability, at the request of the Office of the Interconnection, shall be credited in the amount of the unit's offered price for start-up and no-load fees. The unit also shall receive, if applicable, compensation in accordance with Sections 3.2.3B(e)-(f).

(k) The sum of the foregoing credits as specified in Sections 3.2.3B(b)-(j) shall be the cost of Reactive Services for the purpose of maintaining reactive reliability for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched for the purpose of maintaining reactive reliability in such transmission zone.

(l) The cost of Reactive Services for the purpose of maintaining reactive reliability in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

(m) Generating units receiving dispatch instructions from the Office of the Interconnection under the expectation of increased actual or reserve reactive shall inform the Office of the Interconnection dispatcher if the requested reactive capability is not achievable. Should the operator of a unit receiving such instructions realize at any time during which said instruction is effective that the unit is not, or likely would not be able to, provide the requested amount of reactive support, the operator shall as soon as practicable inform the Office of the Interconnection dispatcher of the unit's inability, or expected inability, to provide the required reactive support, so that the associated dispatch instruction may be cancelled. PJM Performance Compliance personnel will audit operations after-the-fact to determine whether a unit that has altered its active power output at the request of the Office of the Interconnection has provided the actual reactive support or the reactive reserve capability requested by the Office of the Interconnection. PJM shall utilize data including, but not limited to, historical reactive performance and stated reactive capability curves in order to make this determination, and may withhold such compensation as described above if reactive support as requested by the Office of the Interconnection was not or could not have been provided.

3.2.3C Synchronous Condensing for Post-Contingency Operation.

(a) Under normal circumstances, PJM operates generation out of merit order to control contingency overloads when the flow on the monitored element for loss of the contingent

element (“contingency flow”) exceeds the long-term emergency rating for that facility, typically a 4-hour or 2-hour rating. At times however, and under certain, specific system conditions, PJM does not operate generation out of merit order for certain contingency overloads until the contingency flow on the monitored element exceeds the 30-minute rating for that facility (“post-contingency operation”). In conjunction with such operation, when the contingency flow on such element exceeds the long-term emergency rating, PJM operates synchronous condensers in the areas affected by such constraints, to the extent they are available, to provide greater certainty that such resources will be capable of producing energy in sufficient time to reduce the flow on the monitored element below the normal rating should such contingency occur.

(b) The amount of Synchronized Reserve provided by synchronous condensers associated with post-contingency operation shall be counted as Synchronized Reserve satisfying the PJM Synchronized Reserve requirements. Operators of these generation units shall be notified of such provision, and to the extent a generation unit’s operator indicates that the generation unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated in conjunction with post-contingency operation also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing in conjunction with post-contingency operation at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generation resource provided synchronous condensing multiplied by the amount of Synchronized Reserve provided by the synchronous condenser or (ii) the sum of (A) the generation resource’s hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of the megawatts of energy used to provide synchronous condensing multiplied by the real-time LMP at the generation bus of the generation resource, (C) the generation resource’s start-up cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generation resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated in association with post-contingency constraint control was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generation unit’s cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to subsection (d) below.

(c) The sum of the foregoing credits as specified in section 3.2.3C(b) shall be the cost of synchronous condensers associated with post-contingency operations for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched in association with post-contingency operation in such transmission zone.

(d) The cost of synchronous condensers associated with post-contingency operations in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

3.2.4 Transmission Congestion Charges.

Each Market Buyer shall be assessed Transmission Congestion Charges as specified in Section 5 of this Schedule.

3.2.5 Transmission Loss Charges.

Each Market Buyer shall be assessed Transmission Loss Charges as specified in Section 5 of this Schedule.

3.2.6 Emergency Energy.

(a) Market Participants shall be allocated a proportionate share of the net cost of Emergency energy purchased by the Office of the Interconnection. Such allocated share during each hour of such Emergency energy purchase shall be in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales. This deviation shall not include any reduction or suspension of output of pool scheduled resources requested by PJM to manage an Emergency within the PJM Region.

(b) Net revenues in excess of Real-time Prices attributable to sales of energy in connection with Emergencies to other Control Areas shall be credited to Market Participants during each hour of such Emergency energy sale in proportion to the sum of (i) each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales, and (ii) each Market Participant's energy sales from within the PJM Region to entities outside the PJM Region that have been curtailed by PJM.

(c) The net costs or net revenues associated with sales or purchases of hourly energy in connection with a Minimum Generation Emergency in the PJM Region, or in another Control Area, shall be allocated during each hour of such Emergency sale or purchase to each Market Participant in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Market, whenever that deviation increases the Market Participant's spot market sales or decreases its spot market purchases.

3.2.7 Billing.

(a) PJMSettlement shall prepare a billing statement each billing cycle for each Market Buyer in accordance with the charges and credits specified in Sections 3.2.1 through 3.2.6 of this

Schedule, and showing the net amount to be paid or received by the Market Buyer. Billing statements shall provide sufficient detail, as specified in the PJM Manuals, to allow verification of the billing amounts and completion of the Market Buyer's internal accounting.

(b) If deliveries to a Market Buyer that has PJM Interchange meters in accordance with Section 14 of the Operating Agreement include amounts delivered for a Market Participant that does not have PJM Interchange meters separate from those of the metered Market Buyer, PJMSettlement shall prepare a separate billing statement for the unmetered Market Participant based on the allocation of deliveries agreed upon between the Market Buyer and the unmetered Market Participant specified by them to the Office of the Interconnection.

3.3A Economic Load Response Participants.

3.3A.1 Compensation.

Economic Load Response Participants shall be compensated pursuant to Sections 3.3A.5 and/or 3.3A.6 of this Schedule, for demand reduction offers submitted in the Day-Ahead Energy Market or Real-time Energy Market that satisfy the Net Benefits Test of section 3.3A.4; that are scheduled by the Office of the Interconnection; and that follow the dispatch instructions of the Office of the Interconnection. Qualifying demand reductions shall be measured by: 1) comparing actual metered load to an end-use customer's Customer Baseline Load or alternative CBL determined in accordance with the provisions of Section 3.3A.2 or 3.3A.2.01, respectively; or 2) by the MWs produced by On-Site Generators pursuant to the provisions of Section 3.3A.2.02.

3.3A.2 Customer Baseline Load.

For Economic Load Response Participants that choose to measure demand reductions using an end-use customer's Customer Baseline Load ("CBL"), the CBL shall be determined using the following formula for such participant's Non-Variable Loads:

- (a) The CBL for weekdays shall be the average of the highest 4 out of the 5 most recent load weekdays in the 45 calendar day period preceding the relevant load reduction event.
 - i. For the purposes of calculating the CBL for weekdays, weekdays shall not include:
 - 1. NERC holidays;
 - 2. Weekend days;
 - 3. Event days. For the purposes of this section an event day shall be any weekday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.4 or 3.3A.5, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
 - 4. Any weekday where the average daily event period usage is less than 25% of the average event period usage for the five days.
 - ii. If a 45-day period does not include 5 weekdays that meet the conditions in subsection (a)(i) of this section, provided there are 4 weekdays that meet the conditions in subsection (a)(i) of this section, the CBL shall be based on the average of those 4 weekdays. If there are not 4 eligible weekdays, the CBL shall be determined in accordance with subsection (iii) of this section.

- iii. Section 3.3A.2(a)(i)(3) notwithstanding, if a 45-day period does not include 4 weekdays that meet the conditions in subsection (a)(i) of this section, event days will be used as necessary to meet the 4 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(b) The CBL for weekend days and NERC holidays shall be determined in accordance with the following provisions:

- i. The CBL for Saturdays and Sundays/NERC holidays shall be the average of the highest 2 load days out of the 3 most recent Saturdays or Sundays/NERC holidays, respectively, in the 45 calendar day period preceding the relevant load reduction event, provided that the following days shall not be used to calculate a Saturday or Sunday/NERC holiday CBL:
 - 1. Event days. For the purposes of this section an event day shall be any Saturday and Sunday/NERC holiday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.5 or 3.3A.6, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
 - 2. Any Saturday or Sunday/NERC holiday where the average daily event period usage is less than 25% of the average event period usage level for the three days;
 - 3. Any Saturday or Sunday/NERC holiday that corresponds to the beginning or end of daylight savings.
- ii. If a 45-day period does not include 3 Saturdays or 3 Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, provided there are 2 Saturdays or Sundays/NERC holidays that meet the conditions in subsection (b)(i) of this section, the CBL will be based on the average of those 2 Saturdays or Sundays/NERC holidays. If there are not 2 eligible Saturdays or Sundays/NERC holidays, the CBL shall be determined in accordance with subsection (iii) of this section.
- iii. Section 3.3A.2(b)(i)(1) notwithstanding, if a 45-day period does not include 2 Saturdays or Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, event days will be used as necessary to meet the 2 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(c) CBLs established pursuant to this section shall represent end-use customers' actual load patterns. If the Office of the Interconnection determines that a CBL or alternative CBL does not accurately represent a customer's actual load patterns, the CBL shall be revised accordingly pursuant to Section 3.3A.2.01. Consistent with this requirement, if an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer upon whose behalf it is acting that would result in the adjustment of more than half the hours in the affected party's Customer Baseline Load by twenty percent or more for more than twenty days.

3.3A.2.01 Alternative Customer Baseline Methodologies.

(a) During the Economic Load Response Participant registration process pursuant to Section 1.5A.3 of this Schedule, the relevant Economic Load Response Participant or the Office of the Interconnection ("Interested Parties") may, in the case of such participant's Non-Variable Load customers, and shall, in the case of its Variable Load customers, propose an alternative CBL calculation that more accurately reflects the relevant end-use customer's consumption pattern relative to the CBL determined pursuant to Section 3.3A.2. In support of such proposal, the participant shall demonstrate that the alternative CBL method shall result in an hourly relative root mean square error of twenty percent or less compared to actual hourly values, as calculated in accordance with the technique specified in the PJM Manuals. Any proposal made pursuant to this section shall be provided to the other Interested Party.

(b) The Interested Parties shall have 30 days to agree on a proposal issued pursuant to subsection (a) of this section. The 30-day period shall start the day the proposal is provided to the other Interested Party. If both Interested Parties agree on a proposal issued pursuant to this section, that alternative CBL calculation methodology shall be effective consistent with the date of the relevant Economic Load Response Participant registration.

(c) If agreement is not reached pursuant to subsection (b) of this section, the Office of the Interconnection shall determine a CBL methodology within 20 days from the expiration of the 30-day period established by subsection (b). A CBL established by the Office of the Interconnection pursuant to this subsection (c) shall be binding upon both Interested Parties unless the Interested Parties reach agreement on an alternative CBL methodology prior to the expiration of the 20-day period established by this subsection (c).

(d) Operation of this Section 3.3A.2.01 shall not delay Economic Load Response Participant registrations pursuant to Section 1.5A.3, provided that the alternative CBL established pursuant to this section shall be used for all related energy settlements made pursuant to Sections 3.3A.4 and 3.3A.5.

(e) The Office of the Interconnection shall periodically publish alternative CBL methodologies established pursuant to this section in the PJM Manuals.

3.3A.2.02 On-Site Generators.

On-Site Generators used as the basis for Economic Load Response Participant status pursuant to Section 1.5A shall be subject to the following provisions:

- i. The On-Site Generator shall be used solely to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market and shall not otherwise have been operating;
- ii. If subsection (i) does not apply, the amount of energy from an On-Site Generator used to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market shall be capable of being quantified in a manner that is acceptable to the Office of the Interconnection.

3.3A.3 Symmetric Additive Adjustment.

(a) Customer Baseline Levels established pursuant to section 3.3A.2 shall be adjusted by the Symmetric Additive Adjustment. Unless an alternative formula is approved by the Office of the Interconnection, the Symmetric Additive Adjustment shall be calculated using the following formula:

Step 1: Calculate the average usage over the 3 hour period ending 1 hour prior to the start of event.

Step 2: Calculate the average usage over the 3 hour period in the CBL that corresponds to the 3 hour period described in Step 1.

Step 3: Subtract the results of Step 2 from the results of Step 1 to determine the symmetric additive adjustment (this may be positive or negative).

Step 4: Add the symmetric additive adjustment (i.e. the results of Step 3) to each hour in the CBL that corresponds to each event hour.

(b) Following a Load Reduction Event that is submitted to the Office of the Interconnection for compensation, the Office of the Interconnection shall provide the Notification window(s), if applicable, directly metered data and Customer Baseline Load and Symmetric Additive Adjustment calculation to the appropriate electric distribution company for optional review. The electric distribution company will have ten business days to provide the Office of the Interconnection with notification of any issues related to the metered data or calculations.

3.3A.4 Net Benefits Test.

The Office of the Interconnection shall identify each month the price on a supply curve, representative of conditions expected for that month, at which the benefit of load reductions

provided by Economic Load Response Participants exceed the costs of those reductions to other loads. In formulaic terms, the net benefit is deemed to be realized at the price point on the supply curve where $(\Delta \text{LMP} \times \text{MWh consumed}) > (\text{LMP}_{\text{NEW}} \times \text{DR})$, where LMP_{NEW} is the market clearing price after Economic Load Response is dispatched and ΔLMP is the price before Economic Load Response is dispatched minus the LMP_{NEW} .

The Office of the Interconnection shall update and post the Net Benefits Test results and analysis for a calendar month no later than the 15th day of the preceding calendar month. As more fully specified in the PJM Manuals, the Office of the Interconnection shall calculate the net benefit price level in accordance with the following steps:

Step 1. Retrieve generation offers from the same calendar month (of the prior calendar year) for which the calculation is being performed, employing market-based price offers to the extent available, and cost-based offers to the extent market-based price offers are not available. To the extent that generation offers are unavailable from historical data due to the addition of a Zone to the PJM Region the Office of the Interconnection shall use the most recent generation offers that best correspond to the characteristics of the calendar month for which the calculation is being performed, provided that at least 30 days of such data is available. If less than 30 days of data is available for a resource or group of resources, such resource[s] shall not be considered in the Net Benefits Test calculation.

Step 2: Adjust a portion of each prior-year offer representing the typical share of fuel costs in energy offers in the PJM Region, as specified in the PJM Manuals, for changes in fuel prices based on the ratio of the reference month spot price to the study month forward price. For such purpose, natural gas shall be priced at the Henry Hub price, number 2 fuel oil shall be priced at the New York Harbor price, and coal shall be priced as a blend of coal prices representative of the types of coal typically utilized in the PJM Region.

Step 3. Combine the offers to create daily supply curves for each day in the period.

Step 4. Average the daily curves for each day in the month to form an average supply curve for the study month.

Step 5. Use a non-linear least squares estimation technique to determine an equation that reasonably approximates and smooths the average supply curve.

Step 6. Determine the net benefit level as the point at which the price elasticity of supply is equal to 1 for the estimated supply curve equation established in Step 5.

3.3A.5 Market Settlements in Real-time Energy Market.

(a) Economic Load Response Participants that submit offers for load reductions in the Real time Energy Market no later than 6:00 p.m. on the day prior to the operating day that satisfy the Net Benefits Test and that are dispatched by the Office of the Interconnection in the Real-time Energy Market shall be compensated for reducing demand based on the actual kWh relief

provided in excess of committed day-ahead load reductions. The offer shall contain the Offer Data specified in section 1.10.1A(k) and shall not thereafter be subject to change; provided, however, the Economic Load Response Participant may revise the previously specified minimum or maximum load reduction quantity for an operating hour by providing notice to the Office of the Interconnection in the form and manner specified in the PJM Manuals no later than three hours prior to such operating hour. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements. The Economic Load Response Participant that curtails or causes the curtailment of demand in real-time will be compensated by PJM Settlement at the real-time Locational Marginal Price.

(b) In cases where the demand reduction follows dispatch, as defined in section 3.2.3(o-1), as instructed by the Office of the Interconnection, payment will not be less than the total value of the demand reduction bid. For the purposes of this section, the total value of a demand reduction bid shall include any submitted start-up costs associated with reducing demand, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the demand reduction must be committed.

Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, real-time operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) For purposes of load reductions qualifying for compensation hereunder, an Economic Load Response Participant shall accumulate credits for energy reductions in those hours when the energy delivered to the end-use customer is less than the end-use customer's Customer Baseline Load at the corresponding hourly rate. In the event the end-use customer's hourly energy consumption is greater than the Customer Baseline Load, the Economic Load Response Participant will accumulate debits at the corresponding hourly rate for the amount that the end-use customer's hourly energy consumption is greater than the Customer Baseline Load. If the actual load reduction, compared to the desired load reduction is outside the deviation levels specified in section 3.2.3(o) of this Appendix, the Economic Load Response Participant shall be assessed balancing operating reserve charges in accordance with that section 3.2.3.

(d) The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on ratio-share basis based on their real-time loads in each Zone for which the load-weighted average Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, with the ratio shares determined as follows:

The ratio share for LSE i in zone z shall be $RTL_{iz}/(RTL + X)$ and the ratio share for party j shall be $X_j/(RTL + X)$.

Where:

RTL is the total real time load in all zones where LMP > Net Benefits Test price;

RTL_{iz} is the real-time load for LSE i in zone z ;

X is the total export quantity from PJM in that hour; and

X_j is the export quantity by party j from PJM.

3.3A.6 Market Settlements in the Day-ahead Energy Market.

(a) Economic Load Response Participants dispatched as a result of a qualifying demand reduction offer in the Day-ahead Energy Market shall be compensated for reducing demand based on the reductions of kWh committed in the Day-ahead Energy Market. An Economic Load Response Participant that submits a demand reduction bid day ahead that satisfies the Net Benefits Test and is accepted by the Office of the Interconnection shall be paid the day-ahead Locational Marginal Price. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements.

(b) Total payments to Economic Load Response Participants for accepted day-ahead demand reduction bids that follow the dispatch instructions of the Office of the Interconnection will not be less than the total value of the demand reduction bid. For the purposes of this section, the total value of a demand reduction bid shall include any submitted start-up costs associated with reducing load, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the load reduction must be committed. Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, day-ahead operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) Economic Load Response Participants that have demand reductions committed in the Day-ahead Energy Market that deviate from the day-ahead schedule in real time shall be charged or credited for such variance at the real time LMP plus or minus an amount equal to the applicable balancing operating reserve charge in accordance with section 3.2.3 of this Appendix. Load Serving Entities that otherwise would have load that was reduced shall receive any associated operating reserve credit.

(d) The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market

Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average real-time Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, in accordance with the formula prescribed in section 3.3A.5(d).

3.3A.7 Prohibited Economic Load Response Participant Market Settlements.

(a) Settlements pursuant to Sections 3.3A.5 and 3.3A.6 shall be limited to demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market that satisfy the Net Benefits Test and are dispatched by the Office of the Interconnection.

(b) Demand reductions that do not meet the requirements of Section 3.3A.7(a) shall not be eligible for settlement pursuant to Sections 3.3A.5 and 3.3A.6. Examples of settlements prohibited pursuant to this Section 3.3A.7(b) include, but are not limited to, the following:

- i. Settlements based on variable demand where the timing of the demand reduction supporting the settlement did not change in direct response to Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market;
- ii. Consecutive daily settlements that are the result of a change in normal demand patterns that are submitted to maintain a CBL that no longer reflects the relevant end-use customer's demand;
- iii. Settlements based on On-Site Generator data if the On Site Generation is not supporting demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market;
- iv. Settlements based on demand reductions that are the result of operational changes between multiple end-use customer sites in the PJM footprint;
- v. Settlements that do not include all hours that the Office of the Interconnection dispatched the load reduction, or for which the load reduction cleared in the Day-ahead Market.

(c) The Office of the Interconnection shall disallow settlements for demand reductions that do not meet the requirements of Section 3.3A.7(a). If the Economic Load Response Participant continues to submit settlements for demand reductions that do not meet the requirements of Section 3.3A.7(a), then the Office of the Interconnection shall suspend the Economic Load Response Participant's PJM Interchange Energy Market activity and refer the matter to the FERC Office of Enforcement.

3.3A.8 Economic Load Response Participant Review Process.

(a) The Office of the Interconnection shall review the participation of an Economic Load Response Participant in the PJM Interchange Energy Market under the following circumstances:

- i. An Economic Load Response Participant's registrations submitted pursuant to Section 1.5A.3 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).
- ii. An Economic Load Response Participant's settlements pursuant to 3.3A.5 and 3.3A.6 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).
- iii. An Economic Load Response Participant's settlements pursuant to Sections 3.3A.5 and 3.3A.6 are denied by the Office of the Interconnection more than 10% of the time.
- iv. An Economic Load Response Participant's registration will be reviewed when settlements are frequently submitted or if its actual loads frequently deviate from the previously scheduled quantities (as determined for purposes of assessing balancing operating reserves charges). PJM will notify the Participant when their registration is under review. While the Participant's registration is under review by PJM, the Participant may continue economic load reductions but all settlements will be denied by PJM until the registration review is resolved pursuant to subsection (i) or (ii) below. PJM will require the Participant to provide information within 30 days to support that the settlements were submitted for load reduction activity done in response to price and not submitted based on the End-Use Customer's normal operations.
 - i) If the Participant is unable to provide adequate supporting information to substantiate the load reductions submitted for settlement, PJM will terminate the registration and may refer the Participant to either the Market Monitoring Unit or the Federal Energy Regulatory Commission for further investigation.
 - ii) If the Participant does provide adequate supporting information, the settlements denied by PJM will be resubmitted by the Participant for review according to existing PJM market rules. Further, PJM may introduce an alternative Customer Baseline Load if the existing Customer Baseline Load does not adequately reflect what the customer load would have been absent a load reduction.
- v. The electric distribution company may only deny settlements during the normal settlement review process for inaccurate data including, but not limited to: meter data, line loss factor, Customer Baseline Load

calculation, interval meter owner and a known recurring End-Use Customer outage or holiday.

(b) The Office of the Interconnection shall have thirty days to conduct a review pursuant to this Section 3.3A.8. The Office of the Interconnection may refer the matter to the PJM MMU and/or the FERC Office of Enforcement if the review indicates the relevant Economic Load Response Participant and/or relevant electric distribution company or LSE is engaging in activity that is inconsistent with the PJM Interchange Energy Market rules governing Economic Load Response Participants.

ATTACHMENTG

**Revisions to the Schedule 1 of the
PJM Operating Agreement (redlined)**

1.3 Definitions.

1.3.1 Acceleration Request.

“Acceleration Request” shall mean a request pursuant to section 1.9.4A of this Schedule to accelerate or reschedule a transmission outage scheduled pursuant to sections 1.9.2 or 1.9.4.

1.3.1A Auction Revenue Rights.

“Auction Revenue Rights” or “ARRs” shall mean the right to receive the revenue from the Financial Transmission Right auction, as further described in Section 7.4 of this Schedule.

1.3.1B Auction Revenue Rights Credits.

“Auction Revenue Rights Credits” shall mean the allocated share of total FTR auction revenues or costs credited to each holder of Auction Revenue Rights, calculated and allocated as specified in Section 7.4.3 of this Schedule.

1.3.1B.01 Batch Load Demand Resource.

“Batch Load Demand Resource” shall mean a Demand Resource that has a cyclical production process such that at most times during the process it is consuming energy, but at consistent regular intervals, ordinarily for periods of less than ten minutes, it reduces its consumption of energy for its production processes to minimal or zero megawatts.

1.3.1B.02 Congestion Price.

“Congestion Price” shall mean the congestion component of the Locational Marginal Price, which is the effect on transmission congestion costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource, based on the effect of increased generation from or consumption by the resource on transmission line loadings, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.1B.03 Curtailment Service Provider.

“Curtailed Service Provider” or “CSP” shall mean a Member or a Special Member, which action on behalf of itself or one or more other Members or non-Members, participates in the PJM Interchange Energy Market by causing a reduction in demand.

1.3.1B.04 Day-ahead Congestion Price.

“Day-ahead Congestion Price” shall mean the Congestion Price resulting from the Day-ahead Energy Market.

1.3.1C Day-ahead Energy Market.

“Day-ahead Energy Market” shall mean the schedule of commitments for the purchase or sale of energy and payment of Transmission Congestion Charges developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1C.01 Day-ahead Loss Price.

“Day-ahead Loss Price” shall mean the Loss Price resulting from the Day-ahead Energy Market.

1.3.1D Day-ahead Prices.

“Day-ahead Prices” shall mean the Locational Marginal Prices resulting from the Day-ahead Energy Market.

1.3.1D.01 Day-ahead Scheduling Reserves.

“Day-ahead Scheduling Reserves” shall mean thirty-minute reserves as defined by the Reliability First Corporation and SERC.

1.3.1D.02 Day-ahead Scheduling Reserves Requirement.

“Day-ahead Scheduling Reserves Requirement” shall mean the thirty-minute reserve requirement for the PJM Region established consistent with Reliability First Corporation and SERC reliability standards, or those of any additional and/or successor regional reliability organization(s) that are responsible for establishing reliability requirements for the PJM Region, plus any additional thirty-minute reserves scheduled in response to an RTO-wide Hot or Cold Weather Alert or other reasons for conservative operations.

1.3.1D.03 Day-ahead Scheduling Reserves Resources.

“Day-ahead Scheduling Reserves Resources” shall mean synchronized and non-synchronized generation resources and Demand Resources electrically located within the PJM Region that are capable of providing Day-ahead Scheduling Reserves.

1.3.1D.04 Day-ahead Scheduling Reserves Market.

“Day-ahead Scheduling Reserves Market” shall mean the schedule of commitments for the purchase or sale of Day-ahead Scheduling Reserves developed by the Office of the Interconnection as a result of the offers and specifications submitted in accordance with Section 1.10 of this Schedule.

1.3.1D.05 Day-ahead System Energy Price.

“Day-ahead System Energy Price” shall mean the System Energy Price resulting from the Day-ahead Energy Market.

1.3.1E Decrement Bid.

“Decrement Bid” shall mean a bid to purchase energy at a specified location in the Day-ahead Energy Market. An accepted Decrement Bid results in scheduled load at the specified location in the Day-ahead Energy Market.

1.31E.01 Demand Resource.

“Demand Resource” shall mean a resource with the capability to provide a reduction in demand.

1.3.1F Dispatch Rate.

“Dispatch Rate” shall mean the control signal, expressed in dollars per megawatt-hour, calculated and transmitted continuously and dynamically to direct the output level of all generation resources dispatched by the Office of the Interconnection in accordance with the Offer Data.

1.3.1G Energy Storage Resource.

“Energy Storage Resource” shall mean flywheel or battery storage facility solely used for short term storage and injection of energy at a later time to participate in the PJM energy and/or Ancillary Services markets as a Market Seller.

1.3.2 Equivalent Load.

“Equivalent Load” shall mean the sum of a Market Participant’s net system requirements to serve its customer load in the PJM Region, if any, plus its net bilateral transactions.

1.3.2A Economic Load Response Participant.

“Economic Load Response Participant” shall mean a Member or Special Member that qualifies under Section 1.5A of this Schedule to participate in the PJM Interchange Energy Market through reductions in demand.

1.3.2A.01 Economic Minimum.

“Economic Minimum” shall mean the lowest incremental MW output level a unit can achieve while following economic dispatch

1.3.2B Energy Market Opportunity Cost.

“Energy Market Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of available run hours due to limitations imposed on the unit by Applicable Laws and Regulations (as defined in PJM Tariff), and (b) the forecasted future hourly Locational Marginal Price at which the generating

unit could run while not violating such limitations. Energy Market Opportunity Cost therefore is the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same compliance period, which compliance period is determined by the applicable regulatory authority and is reflected in the rules set forth in PJM Manual 15. Energy Market Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Energy Market Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.3 External Market Buyer.

"External Market Buyer" shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for consumption by end-users outside the PJM Region, or for load in the PJM Region that is not served by Network Transmission Service.

1.3.4 External Resource.

"External Resource" shall mean a generation resource located outside the metered boundaries of the PJM Region.

1.3.5 Financial Transmission Right.

"Financial Transmission Right" or "FTR" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2 of this Schedule.

1.3.5A Financial Transmission Right Obligation.

"Financial Transmission Right Obligation" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(b) of this Schedule.

1.3.5B Financial Transmission Right Option.

"Financial Transmission Right Option" shall mean a right to receive Transmission Congestion Credits as specified in Section 5.2.2(c) of this Schedule.

1.3.6 Generating Market Buyer.

"Generating Market Buyer" shall mean an Internal Market Buyer that is a Load Serving Entity that owns or has contractual rights to the output of generation resources capable of serving the Market Buyer's load in the PJM Region, or of selling energy or related services in the PJM Interchange Energy Market or elsewhere.

1.3.7 Generator Forced Outage.

“Generator Forced Outage” shall mean an immediate reduction in output or capacity or removal from service, in whole or in part, of a generating unit by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the facility, as specified in the relevant portions of the PJM Manuals. A reduction in output or removal from service of a generating unit in response to changes in market conditions shall not constitute a Generator Forced Outage.

1.3.8 Generator Maintenance Outage.

“Generator Maintenance Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit in order to perform necessary repairs on specific components of the facility, if removal of the facility meets the guidelines specified in the PJM Manuals.

1.3.9 Generator Planned Outage.

“Generator Planned Outage” shall mean the scheduled removal from service, in whole or in part, of a generating unit for inspection, maintenance or repair with the approval of the Office of the Interconnection in accordance with the PJM Manuals.

1.3.9A Increment Bid.

“Increment Bid” shall mean an offer to sell energy at a specified location in the Day-ahead Energy Market. An accepted Increment Bid results in scheduled generation at the specified location in the Day-ahead Energy Market.

1.3.9B Interface Pricing Point.

“Interface Pricing Point” shall have the meaning specified in section 2.6A.

1.3.10 Internal Market Buyer.

“Internal Market Buyer” shall mean a Market Buyer making purchases of energy from the PJM Interchange Energy Market for ultimate consumption by end-users inside the PJM Region that are served by Network Transmission Service.

1.3.11 Inadvertent Interchange.

“Inadvertent Interchange” shall mean the difference between net actual energy flow and net scheduled energy flow into or out of the individual Control Areas operated by PJM.

1.3.11.01 Load Management.

“Load Management” shall mean either a Demand Resource (“DR”) or an Interruptible Load for Reliability (“ILR”) resource, both as defined in the Reliability Assurance Agreement.

1.3.11A Load Reduction Event.

“Load Reduction Event” shall mean a reduction in demand by a Member or Special Member for the purpose of participating in the PJM Interchange Energy Market.

1.3.11B Loss Price.

“Loss Price” shall mean the loss component of the Locational Marginal Price, which is the effect on transmission loss costs (whether positive or negative) associated with increasing the output of a generation resource or decreasing the consumption by a Demand Resource based on the effect of increased generation from or consumption by the resource on transmission losses, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.12 Market Operations Center.

“Market Operations Center” shall mean the equipment, facilities and personnel used by or on behalf of a Market Participant to communicate and coordinate with the Office of the Interconnection in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.12A Maximum Emergency.

“Maximum Emergency” shall mean the designation of all or part of the output of a generating unit for which the designated output levels may require extraordinary procedures and therefore are available to the Office of the Interconnection only when the Office of the Interconnection declares a Maximum Generation Emergency and requests generation designated as Maximum Emergency to run. The Office of the Interconnection shall post on the PJM website the aggregate amount of megawatts that are classified as Maximum Emergency.

1.3.13 Maximum Generation Emergency.

“Maximum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection to address either a generation or transmission emergency in which the Office of the Interconnection anticipates requesting one or more Generation Capacity Resources, or Non-Retail Behind The Meter Generation resources to operate at its maximum net or gross electrical power output, subject to the equipment stress limits for such Generation Capacity Resource or Non-Retail Behind The Meter resource in order to manage, alleviate, or end the Emergency.

1.3.14 Minimum Generation Emergency.

“Minimum Generation Emergency” shall mean an Emergency declared by the Office of the Interconnection in which the Office of the Interconnection anticipates requesting one or more generating resources to operate at or below Normal Minimum Generation, in order to manage, alleviate, or end the Emergency.

1.3.14A NERC Interchange Distribution Calculator.

“NERC Interchange Distribution Calculator” shall mean the NERC mechanism that is in effect and being used to calculate the distribution of energy, over specific transmission interfaces, from energy transactions.

1.3.14B Net Benefits Test.

“Net Benefits Test” shall mean a calculation to determine whether the benefits of a reduction in price resulting from the dispatch of Economic Load Response exceeds the cost to other loads resulting from the billing unit effects of the load reduction, as specified in Section 3.3A.4 of this Schedule.

1.3.15 Network Resource.

“Network Resource” shall have the meaning specified in the PJM Tariff.

1.3.16 Network Service User.

“Network Service User” shall mean an entity using Network Transmission Service.

1.3.17 Network Transmission Service.

“Network Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part III of the PJM Tariff, or transmission service comparable to such service that is provided to a Load Serving Entity that is also a Transmission Owner.

1.3.17A Non-Regulatory Opportunity Cost.

“Non-Regulatory Opportunity Cost” shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) a fuel supply limitation, for up to one year, resulting from an event of force majeure; and, (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Non-Regulatory Opportunity Cost therefore is the value associated with a specific generating unit’s lost opportunity to produce energy during a higher valued period of time occurring within the same period of time in which the unit is bound by the referenced restrictions, and is reflected in the rules set forth in PJM Manual 15. Non-Regulatory Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement. Generation Capacity Resources recovering Non-Regulatory Opportunity Cost that self-schedule generation run hours 50% or less of the total available run hours shall consider the generation unit outages when the limited number of available run hours are exhausted as an Out of Management Control (OMC) Outage.

1.3.17B Non-Variable Loads.

“Non-Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.18 Normal Maximum Generation.

“Normal Maximum Generation” shall mean the highest output level of a generating resource under normal operating conditions.

1.3.19 Normal Minimum Generation.

“Normal Minimum Generation” shall mean the lowest output level of a generating resource under normal operating conditions.

1.3.20 Offer Data.

“Offer Data” shall mean the scheduling, operations planning, dispatch, new resource, and other data and information necessary to schedule and dispatch generation resources and Demand Resource(s) for the provision of energy and other services and the maintenance of the reliability and security of the transmission system in the PJM Region, and specified for submission to the PJM Interchange Energy Market for such purposes by the Office of the Interconnection.

1.3.21 Office of the Interconnection Control Center.

“Office of the Interconnection Control Center” shall mean the equipment, facilities and personnel used by the Office of the Interconnection to coordinate and direct the operation of the PJM Region and to administer the PJM Interchange Energy Market, including facilities and equipment used to communicate and coordinate with the Market Participants in connection with transactions in the PJM Interchange Energy Market or the operation of the PJM Region.

1.3.21A On-Site Generators.

“On-Site Generators” shall mean generation facilities (including Behind The Meter Generation) that (i) are not Capacity Resources, (ii) are not injecting into the grid, (iii) are either synchronized or non-synchronized to the Transmission System, and (iv) can be used to reduce demand for the purpose of participating in the PJM Interchange Energy Market.

1.3.22 Operating Day.

“Operating Day” shall mean the daily 24 hour period beginning at midnight for which transactions on the PJM Interchange Energy Market are scheduled.

1.3.23 Operating Margin.

“Operating Margin” shall mean the incremental adjustments, measured in megawatts, required in PJM Region operations in order to accommodate, on a first contingency basis, an operating contingency in the PJM Region resulting from operations in an interconnected Control Area. Such adjustments may result in constraints causing Transmission Congestion Charges, or may result in Ancillary Services charges pursuant to the PJM Tariff.

1.3.24 Operating Margin Customer.

“Operating Margin Customer” shall mean a Control Area purchasing Operating Margin pursuant to an agreement between such other Control Area and the LLC.

1.3.25 PJM Interchange.

“PJM Interchange” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds, or is exceeded by, the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller; or (e) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (f) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.26 PJM Interchange Export.

“PJM Interchange Export” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load is exceeded by the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup sales; or (c) the hourly scheduled deliveries of Spot Market Energy by a Market Seller from an External Resource; or (d) the hourly net metered output of any other Market Seller.

1.3.27 PJM Interchange Import.

“PJM Interchange Import” shall mean the following, as determined in accordance with the Schedules to this Agreement: (a) for a Market Participant that is a Network Service User, the amount by which its hourly Equivalent Load exceeds the sum of the hourly outputs of its operating generating resources; or (b) for a Market Participant that is not a Network Service User, the amount of its Spot Market Backup purchases; or (c) the hourly scheduled deliveries of Spot Market Energy to an External Market Buyer; or (d) the hourly scheduled deliveries to an Internal Market Buyer that is not a Network Service User.

1.3.28 PJM Open Access Same-time Information System.

“PJM Open Access Same-time Information System” shall mean the electronic communication system for the collection and dissemination of information about transmission services in the PJM Region, established and operated by the Office of the Interconnection in accordance with FERC standards and requirements.

1.3.28A Planning Period Quarter.

“Planning Period Quarter” shall mean any of the following three month periods in the Planning Period: June, July and August; September, October and November; December, January and February; or March, April and May.

1.3.28B Planning Period Balance.

“Planning Period Balance” shall mean the entire period of time remaining in the Planning Period following the month that a monthly auction is conducted.

1.3.29 Point-to-Point Transmission Service.

“Point-to-Point Transmission Service” shall mean transmission service provided pursuant to the rates, terms and conditions set forth in Part II of the PJM Tariff.

1.3.30 Ramping Capability.

“Ramping Capability” shall mean the sustained rate of change of generator output, in megawatts per minute.

1.3.30.01 Real-time Congestion Price.

“Real-time Congestion Price” shall mean the Congestion Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30.02 Real-time Loss Price.

“Real-time Loss Price” shall mean the Loss Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30A Real-time Prices.

“Real-time Prices” shall mean the Locational Marginal Prices resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.30B Real-time Energy Market.

“Real-time Energy Market” shall mean the purchase or sale of energy and payment of Transmission Congestion Charges for quantity deviations from the Day-ahead Energy Market in the Operating Day.

1.3.30B.01 Real-time System Energy Price.

“Real-time System Energy Price” shall mean the System Energy Price resulting from the Office of the Interconnection’s dispatch of the PJM Interchange Energy Market in the Operating Day.

1.3.31 Regulation.

“Regulation” shall mean the capability of a specific generation resource or Demand Resource with appropriate telecommunications, control and response capability to increase or decrease its output or adjust load in response to a regulating control signal, in accordance with the specifications in the PJM Manuals.

1.3.31.01 Residual Auction Revenue Rights.

“Residual Auction Revenue Rights” shall mean incremental stage 1 Auction Revenue Rights created within a Planning Period by an increase in transmission system capability or a change in any other relevant factor that was not modeled pursuant to section 7.5 of Schedule 1 of this Agreement in compliance with section 7.4.2(h) of Schedule 1 of this Agreement, and, if modeled, would have increased the amount of stage 1 Auction Revenue Rights allocated pursuant to section 7.4.2 of Schedule 1 of this Agreement; provided that, the foregoing notwithstanding, Residual Auction Revenue Rights shall exclude: 1) Incremental Auction Revenue Rights allocated pursuant to Part VI of the Tariff; and 2) Auction Revenue Rights allocated to entities that are assigned cost responsibility pursuant to Schedule 6 of this Agreement for transmission upgrades that create such rights.

1.3.31.02 Special Member.

“Special Member” shall mean an entity that satisfies the requirements of Section 1.5A.02 of this Schedule or the special membership provisions established under the Emergency Load Response Program.

1.3.31A [Reserved.]

1.3.31B [Reserved.]

1.3.32 Spot Market Backup.

“Spot Market Backup” shall mean the purchase of energy from, or the delivery of energy to, the PJM Interchange Energy Market in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason.

1.3.33 Spot Market Energy.

“Spot Market Energy” shall mean energy bought or sold by Market Participants through the PJM Interchange Energy Market at System Energy Prices determined as specified in Section 2 of this Schedule.

1.3.33A State Estimator.

“State Estimator” shall mean the computer model of power flows specified in Section 2.3 of this Schedule.

1.3.33B Station Power.

“Station Power” shall mean energy used for operating the electric equipment on the site of a generation facility located in the PJM Region or for the heating, lighting, air-conditioning and office equipment needs of buildings on the site of such a generation facility that are used in the operation, maintenance, or repair of the facility. Station Power does not include any energy (i) used to power synchronous condensers; (ii) used for pumping at a pumped storage facility; (iii) used for compressors at a compressed air energy storage facility; (iv) used for charging an Energy Storage Resource; or (v) used in association with restoration or black start service.

1.3.33B.01 Synchronized Reserve.

“Synchronized Reserve” shall mean the reserve capability of generation resources that can be converted fully into energy or Demand Resources whose demand can be reduced within ten minutes from the request of the Office of the Interconnection dispatcher, and is provided by equipment that is electrically synchronized to the Transmission System.

1.3.33B.02 Synchronized Reserve Event.

“Synchronized Reserve Event” shall mean a request from the Office of the Interconnection to generation resources and/or Demand Resources able, assigned or self-scheduled to provide Synchronized Reserve, within ten minutes, to increase the energy output or reduce load by the amount of assigned or self-scheduled Synchronized Reserve capability.

1.3.33B.03 System Energy Price.

“System Energy Price” shall mean the energy component of the Locational Marginal Price, which is the price at which the Market Seller has offered to supply an additional increment of energy from a resource, calculated as specified in Section 2 of Schedule 1 of this Agreement.

1.3.33C Target Allocation.

“Target Allocation” shall mean the allocation of Transmission Congestion Credits as set forth in Section 5.2.3 of this Schedule or the allocation of Auction Revenue Rights Credits as set forth in Section 7.4.3 of this Schedule.

1.3.34 Transmission Congestion Charge.

“Transmission Congestion Charge” shall mean a charge attributable to the increased cost of energy delivered at a given load bus when the transmission system serving that load bus is operating under constrained conditions, or as necessary to provide energy for third-party transmission losses in accordance with Section 9.3, which shall be calculated and allocated as specified in Section 5.1 of this Schedule.

1.3.35 Transmission Congestion Credit.

“Transmission Congestion Credit” shall mean the allocated share of total Transmission Congestion Charges credited to each holder of Financial Transmission Rights, calculated and allocated as specified in Section 5.2 of this Schedule.

1.3.36 Transmission Customer.

“Transmission Customer” shall mean an entity using Point-to-Point Transmission Service.

1.3.37 Transmission Forced Outage.

“Transmission Forced Outage” shall mean an immediate removal from service of a transmission facility by reason of an Emergency or threatened Emergency, unanticipated failure, or other cause beyond the control of the owner or operator of the transmission facility, as specified in the relevant portions of the PJM Manuals. A removal from service of a transmission facility at the request of the Office of the Interconnection to improve transmission capability shall not constitute a Forced Transmission Outage.

1.3.37A Transmission Loading Relief.

“Transmission Loading Relief” shall mean NERC’s procedures for preventing operating security limit violations, as implemented by PJM as the security coordinator responsible for maintaining transmission security for the PJM Region.

1.3.37B Transmission Loading Relief Customer.

“Transmission Loading Relief Customer” shall mean an entity that, in accordance with Section 1.10.6A, has elected to pay Transmission Congestion Charges during Transmission Loading Relief in order to continue energy schedules over contract paths outside the PJM Region that are increasing the cost of energy in the PJM Region.

1.3.37C Transmission Loss Charge.

“Transmission Loss Charge” shall mean the charges to each Market Participant, Network Customer, or Transmission Customer for the cost of energy lost in the transmission of electricity from a generation resource to load as specified in Section 5 of this Schedule.

1.3.38 Transmission Planned Outage.

“Transmission Planned Outage” shall mean any transmission outage scheduled in advance for a pre-determined duration and which meets the notification requirements for such outages specified in this Agreement or the PJM Manuals.

1.3.38A Variable Loads.

“Variable Loads” shall have the meaning specified in section 1.5A.6 of this Schedule.

1.3.39 Zonal Base Load.

“Zonal Base Load” shall mean the lowest daily zonal peak load from the twelve month period ending October 21 of the calendar year immediately preceding the calendar year in which an annual Auction Revenue Right allocation is conducted, increased by the projected load growth rate for the relevant Zone.

1.5A Economic Load Response Participant.

As used in this section 1.5A, the term “end-use customer” refers to an individual location or aggregation of locations that consume electricity as identified by a unique electric distribution company account number.

1.5A.1 Qualification.

A Member or Special Member that is an end-use customer, Load Serving Entity or Curtailment Service Provider that has the ability to cause a reduction in demand as metered on an electric distribution company account basis or has an On-Site Generator that enables demand reduction may become an Economic Load Response Participant by complying with the requirements of the applicable Relevant Electric Retail Regulatory Authority and all other applicable federal, state and local regulatory entities together with this section 1.5A including, but not limited to, section 1.5A.3. A Member or Special Member may aggregate multiple individual end-use customer sites to qualify as an Economic Load Response Participant, subject to the requirements of Section 1.5A.10.

1.5A.2 Special Member.

Entities that are not Members and desire to participate solely in the Real-time Energy Market by reducing demand may become a Special Member by paying an annual membership fee of \$500 plus 10% of each payment owed by PJM Settlement for a Load Reduction Event not to exceed \$5,000 in a calendar year. For entities that become Special Members pursuant to this section, the following obligations are waived: (1) the \$1,500 membership application fee set forth in section 1.4.3 of this Agreement; (ii) liability under section 15.2 of this Agreement for Member defaults; (iii) thirty days notice for waiting period; and (iv) the requirement for 24/7 control center coverage. In addition, such Members shall not have voting privileges in committees or sector designations, and shall not be permitted to form user groups. On January 1 of a calendar year, a Special Member under this section, at its sole election, may become a Member rather than a Special Member subject to all rules governing being a Member, including regular application and membership fee requirements.

1.5A.3 Registration.

1. Prior to participating in the PJM Interchange Energy Market or Ancillary Services Market, Economic Load Response Participants must complete the Economic Load Response Registration Form posted on the Office of the Interconnection’s website and submit such form to the Office of the Interconnection for each end-use customer, or aggregation of end-use customers, pursuant to the requirements set forth in the PJM Manuals.

a. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the appropriate

electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is subject to another contractual obligation or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program, ~~and for confirmation of any associated transmission or distribution charges~~. The electric distribution company or Load Serving Entity shall have ten business days to respond. An electric distribution company or Load Serving Entity which seeks to assert that the laws or regulations of the Relevant Electric Retail Regulatory Authority prohibit or condition (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response program shall provide to PJM, within the referenced ten business day review period, either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall assume that the load to be reduced is not subject to other contractual obligations or to laws or regulations of the Relevant Electric Retail Regulatory Authority that prohibit or condition the end-use customer's participation in PJM's Economic Load Response Program, and the Office of the Interconnection shall accept the registration, provided it meets the requirements of this section 1.5A

b. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:

i. After confirming that an entity has met all of the qualifications to be an Economic Load Response Participant, the Office of the Interconnection shall notify the appropriate electric distribution company or Load Serving Entity of an Economic Load Response Participant's registration and request verification as to whether the load that may be reduced is permitted to participate in PJM's Economic Load Response Program, ~~and, if permitted, confirmation of any associated transmission or distribution charges~~. The electric distribution company or Load Serving Entity shall have ten business days to respond. If the electric distribution company or Load Serving Entity verifies that the load that may be reduced is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then the electric distribution company or Load Serving Entity must provide to the Office of the Interconnection within the referenced ten business day review period evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the

Relevant Electric Retail Regulatory Authority permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

ii. In the absence of a response from the electric distribution company or Load Serving Entity within the referenced ten business day review period, the Office of the Interconnection shall reject the registration. If it is able to do so in compliance with section 1.5A hereof, including section 1.5A.3, the Economic Load Response Participant may submit a new registration for consideration if a prior registration has been rejected pursuant to this subsection.

2. In the event that the end-use customer is subject to another contractual obligation, special settlement terms may be employed to accommodate such contractual obligation. The Office of the Interconnection shall notify the end-use customer or appropriate Curtailment Service Provider, electric distribution company or Load Serving Entity that the Economic Load Response Participant has or has not met the requirements of this section 1.5A. End-use customers that desire not to be simultaneously registered to reduce demand under the Emergency Load Response Program and under this section, upon one-day advance notice to the Office of the Interconnection, may switch its registration for reducing demand, if it has been registered to reduce load for 15 consecutive days under its current registration.

1.5A.3.01 Economic Load Response Registrations in Effect as of August 28, 2009

1. For end-use customers of an electric distribution company that distributed more than 4 million MWh in the previous fiscal year:

a. Effective as of the later of either August 28, 2009 (the effective date of Wholesale Competition in Regions with Organized Electric Markets, Order 719-A, 128 FERC ¶ 61,059 (2009) ("Order 719-A")) or the effective date of a Relevant Electric Retail Regulatory Authority law or regulation prohibiting or conditioning (which condition the electric distribution company or Load Serving Entity asserts has not been satisfied) the end-use customer's participation in PJM's Economic Load Response Program, the existing Economic Load Response Participant's registration submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated upon an electric distribution company or Load Serving Entity submitting to the Office of the Interconnection either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority prohibiting or conditioning the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the

Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law prohibiting or conditioning the end-use customer's participation.

- i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.

2. For end-use customers of an electric distribution company that distributed 4 million MWh or less in the previous fiscal year:

- a. Effective as of August 28, 2009 (the effective date of Order 719-A), an existing Economic Load Response Participants' registrations submitted to the Office of the Interconnection prior to August 28, 2009, will be deemed to be terminated unless an electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program and provides evidence to the Office of the Interconnection documenting that the permission or conditional permission is pursuant to the laws or regulations of the Relevant Electric Retail Regulatory Authority. If the electric distribution company or Load Serving Entity verifies that the existing registration is permitted or conditionally permitted (which condition the electric distribution company or Load Serving Entity asserts has been satisfied) to participate in the Economic Load Response Program, then, within ten business days of verifying such permission or conditional permission, the electric distribution company or Load Serving Entity must provide to the Office of the Interconnection evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program. Evidence from the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the Economic Load Response Participant to participate in the Economic Load Response Program shall be in the form of either: (a) an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation, (b) an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation, or (c) an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

- i. For registrations terminated pursuant to this section, all Economic Load Response Participant activity incurred prior to the termination date of the registration shall be settled by PJMSettlement in accordance with the terms and conditions contained in the PJM Tariff, PJM Operating Agreement and PJM Manuals.

3. All registrations submitted to the Office of the Interconnection on or after August 28, 2009, including requests to extend existing registrations, will be processed by the Office of the Interconnection in accordance with the provisions of section 1.5A, including section 1.5A.3.

1.5A.4 Metering and Electronic Dispatch Signal.

a) The Curtailment Service Provider is responsible to ensure that the Economic Load Response Participants have metering equipment that provides integrated hourly kWh values on an electric distribution company account basis. The metering equipment shall either meet the electric distribution company requirements for accuracy, or have a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment and associated data shall meet the requirements set forth herein and in the PJM Manuals. The Economic Load Response Participant must meter reductions in demand either by recording integrated hourly values for On-Site Generators running to serve local load (net of output used by the On-Site Generator), by metering load on an electric distribution company account basis and comparing actual metered load to its Customer Baseline Load, calculated pursuant to section 3.3A of this Schedule, or on an alternative metering basis approved by the Office of the Interconnection and agreed upon by all relevant parties, including any Curtailment Service Provider, Load Serving Entity and end-use customer. To qualify for compensation for such load reductions that are not metered directly by the Office of the Interconnection, hourly data reflecting meter readings for each hour-day during in which the load reduction occurred and all associated days to determine the reduction must be submitted to the Office of the Interconnection in accordance with the PJM Manuals within 60 days of the load reduction.

b) Curtailment Service Providers shall be responsible for maintaining, or ensuring that Economic Load Response Participants maintain, the capability to receive and act upon an electronic dispatch signal from the Office of the Interconnection in accordance with any standards and specifications contained in the PJM Manuals.

1.5A.5 On-Site Generators.

An Economic Load Response Participant that intends to use an On-Site Generator for the purpose of reducing demand to participate in the PJM Interchange Energy Market shall represent to the Office of the Interconnection in writing that it holds all necessary environmental permits applicable to the operation of the On-Site Generator. Unless notified otherwise, the Office of the Interconnection shall deem such representation applies to each time the On-Site Generator is used to reduce demand to enable participation in the PJM Interchange Energy Market and that the On-Site Generator is being operated in compliance with all applicable permits, including any emissions, run-time limits or other operational constraints that may be imposed by such permits.

1.5A.6 ~~[Reserved for Future Use]~~ Variable-Load Customers.

The loads of an Economic Load Response Participant shall be categorized as Variable or Non-variable at the time the load is registered, based on hourly load data for the most recent 60 days provided by the participant in the registration process; provided, however, that any alternative means of making such determination when 60 days of data is not available shall be subject to review and approval by the Office of the Interconnection. Non-Variable Loads shall be those for which the Customer Baseline Load calculation and adjustment methods prescribed by sections 3.3A.2 and 3.3A.3 result in a relative root mean square hourly error of twenty percent or less

compared to the actual hourly loads based on the hourly load data provided in the registration process and using statistical methods prescribed in the PJM Manuals. All other loads shall be Variable Loads.

1.5A.7 Non-Hourly Metered Customer Pilot.

Non-hourly metered customers may participate in the PJM Interchange Energy Market as Economic Load Response Participants on a pilot basis under the following circumstances. The customer or its Curtailment Service Provider or Load Serving Entity must propose an alternate method for measuring hourly demand reductions. The Office of the Interconnection shall approve alternate measurement mechanisms on a case-by-case basis for a time specified by the Office of the Interconnection (“Pilot Period”). In the event an alternative measurement mechanism is approved, the Office of the Interconnection shall notify the affected Load Serving Entity(ies) that a proposed alternate measurement mechanism has been approved for a Pilot Period. Demand reductions by non-hourly metered customers using alternate measurement mechanisms on a pilot basis shall be limited to a combined total of 500 MW of reductions in both the Emergency Load Response Program and the PJM Interchange Energy Market. With the sole exception of the requirement for hourly metering as set forth in Section 1.5A.04 of this Schedule, non-hourly metered customers that qualify as Economic Load Response Participants pursuant to this section 1.5A.07 shall be subject to the rules and procedures for participation by Economic Load Response Participants in the PJM Interchange Energy Market, including, without limitation, the Net Benefits Test and the requirement for dispatch by the Office of the Interconnection. Following completion of a Pilot Period, the alternate method shall be evaluated by the Office of the Interconnection to determine whether such alternate method should be included in the PJM Manuals as an accepted measurement mechanism for demand reductions in the PJM Interchange Energy Market.

1.5A.8 Batch Load Demand Resource Provision of Synchronized Reserve or Day-ahead Scheduling Reserves.

(a) A Batch Load Demand Resource may provide Synchronized Reserve or Day-ahead Scheduling Reserves in the PJM Interchange Energy Market provided it has pre-qualified by providing the Office of the Interconnection with documentation acceptable to the Office of the Interconnection that shows six months of one minute incremental load history of the Batch Load Demand Resource, or in the event such history is unavailable, other such information or data acceptable to the Office of the Interconnection to demonstrate that the resource meets the definition of “Batch Load Demand Resource” pursuant to section 1.3.1A.001 of this Schedule. This requirement is a one-time pre-qualification requirement for a Batch Load Demand Resource.

(b) Batch Load Demand Resources may provide up to 20 percent of the total system-wide PJM Synchronized Reserve requirement in any hour, or up to 20 percent of the total system-wide Day-ahead Scheduling Reserves requirement in any hour; provided, however, that in the event the Office of the Interconnection determines in its sole discretion that satisfying 20 percent of either such requirement from Batch Load Demand Resources is causing or may cause a reliability degradation, the Office of the Interconnection may reduce the percentage of either

such requirement that may be satisfied by Batch Load Demand Resources in any hour to as low as 10 percent. This reduction will be effective seven days after the posting of the reduction on the PJM website. Notwithstanding anything to the contrary in this Agreement, as soon as practicable, the Office of the Interconnection unilaterally shall make a filing under section 205 of the Federal Power Act to revise the rules for Batch Load Demand Resources so as to continue such reduction. The reduction shall remain in effect until the Commission acts upon the Office of the Interconnection's filing and thereafter if approved or accepted by the Commission.

(c) A Batch Load Demand Resource that is consuming energy at the start of a Synchronized Reserve Event, or, if committed to provide Day-ahead Scheduling Reserves, at the time of a dispatch instruction from the Office of the Interconnection to reduce load, shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event, or to such instruction to reduce load, by reducing load as quickly as it is capable and by keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following the reduction, or, in the case of Day-ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required. A Batch Load Demand Resource that has reduced its consumption of energy for its production processes to minimal or zero megawatts before the start of a Synchronized Reserve Event (or, in the case of Day-ahead Scheduling Reserves, before a dispatch instruction to reduce load) shall respond to the Office of the Interconnection's calling of a Synchronized Reserve Event (or such instruction to reduce load) by reducing any load that is present at the time the Synchronized Reserve Event is called (or at the time of such instruction to reduce load) as quickly as it is capable, delaying the restart of its production processes, and keeping its consumption at or near zero megawatts for the entire length of the Synchronized Reserve Event following any such reduction (or, in the case of Day-ahead Scheduling Reserves, until a dispatch instruction that load reductions are no longer required). Failure to respond as described in this section shall be considered non-compliance with the Office of the Interconnection's dispatch instruction associated with a Synchronized Reserve Event, or as applicable, associated with an instruction to a resource committed to provide Day-ahead Scheduling Reserves to reduce load.

1.5A.9 Day-ahead and Real-time Energy Market Participation.

Economic Load Response Participants ~~may shall be compensated under section 3.3A.5 and 3.3A.6 only if they~~ participate in the Day-ahead ~~and-or~~ Real-time Energy Markets as a dispatchable ~~or self-scheduled~~ resources, ~~provided that Demand Resources that are self-scheduled pursuant to Section 1.5A.9(a) shall not be dispatched by the Office of the Interconnection pursuant to this section.~~

~~——(a)—— Self-scheduled Demand Resources shall be subject to the following requirements:~~

- ~~i.—— An Economic Load Response Participant self-scheduling a Demand Resource shall notify the Office of the Interconnection no less than 5 minutes prior to beginning a load reduction event and no more than 7 days prior to an event;~~

- ~~ii. Economic Load Response Participants may self-schedule a Demand Resource intra-hour;~~
- ~~iii. A Notification pursuant to this section may be withdrawn or adjusted downward during the relevant event hour, but not after the event hour;~~
- ~~iv. A Notification submitted pursuant to this section shall include the start and stop times of the event and the amount of the demand reduction;~~
- ~~v. The event period for self-scheduled Demand Resources shall be defined as all hours in the day for which the Economic Load Response Participant has provided a Notification.~~

1.5A.10 Economic Load Response Participant Aggregation.

The purpose for aggregation is to allow the participation of End-Use Customers in the Energy Market that can provide less than 100 kW of demand response when they currently have no alternative opportunity to participate on an individual basis or can provide less than 500 kW of demand response in the Day-Ahead Scheduling Reserve, Synchronized Reserve or Regulation markets when they currently have no alternative opportunity to participate on an individual basis. Aggregations pursuant to Section 1.5A.1 shall be subject to the following requirements:

- i. All End-Use Customers in an aggregation shall be specifically identified;
- ii. All End-Use Customers in an aggregation shall be served by the same electric distribution company or Load Serving Entity where the electric distribution company is the Load Serving Entity for all End-Use Customers in the aggregation. If the aggregation will provide Synchronized Reserves, all customers in the aggregation must also be part of the same Synchronized Reserve sub-zone;
- iii. All End-Use Customers in an aggregation that settle at Transmission Zone, existing load aggregate, or node prices shall be located in the same Transmission Zone, existing load aggregate or at the same node, respectively;
- iv. ~~If all End-Use Customers in an aggregation are not subject to the same generation and transmission charges, the generation and transmission charge for the aggregation shall be the load-weighted average of the generation and transmission charges for all End-Use Customers in the aggregation. The Economic Load Response Participant shall provide the load-weighted average, the calculation of the load-weighted average, and the supporting data to the Load Serving Entity and PJM. For the purposes of this section, the applicable generation and transmission charges are the charges an End-Use Customer would have otherwise paid the Load Serving Entity absent the demand reduction;~~

- ~~v.~~ A single CBL for the aggregation shall be used to determine settlements pursuant to Sections 3.3A.4~~5~~ and 3.3A.5~~6~~;
- vi. If the aggregation will only provide energy to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 99 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve. If the aggregation will provide an Ancillary Service to the market then only one End-Use Customer within the aggregation shall have the ability to reduce more than 499 kW of load unless the Curtailment Service Provider, Load Serving Entity and PJM approve;
- vii. Each End-Use Customer site must meet the requirements for market participation by a Demand Resource except for the 100 kW minimum load reduction requirement for energy or the 500 kW minimum load reduction requirement for Ancillary Services; and
- viii. An End-Use Customer's participation in the Energy and Ancillary Services markets shall be administered under one economic registration.

1.5A.11 Reporting

- (a) PJM will post on its website a report of demand response activity, and will provide a summary thereof to the PJM Markets and Reliability Committee on an annual basis.
- (b) As PJM receives evidence from the electric distribution companies or Load Serving Entities pursuant to section 1.5A.3, PJM will post on its website a list of those Relevant Electric Retail Regulatory Authorities that the electric distribution companies or Load Serving Entities assert prohibit or condition retail participation in PJM's Economic Load Response Program together with a corresponding reference to the Relevant Electric Retail Regulatory Authority evidence that is provided to PJM by the electric distribution companies or Load Serving Entities.

1.7 General.

1.7.1 Market Sellers.

Only Market Sellers shall be eligible to submit offers to the Office of the Interconnection for the sale of electric energy or related services in the PJM Interchange Energy Market. Market Sellers shall comply with the prices, terms, and operating characteristics of all Offer Data submitted to and accepted by the PJM Interchange Energy Market.

1.7.2 Market Buyers.

Only Market Buyers shall be eligible to purchase energy or related services in the PJM Interchange Energy Market. Market Buyers shall comply with all requirements for making purchases from the PJM Interchange Energy Market.

1.7.2A Economic Load Response Participants.

Only Economic Load Response Participants shall be eligible to participate in the Real-time Energy Market and the Day-ahead Energy Market by submitting offers to the Office of the Interconnection to reduce demand.

1.7.3 Agents.

A Market Participant may participate in the PJM Interchange Energy Market through an agent, provided that the Market Participant informs the Office of the Interconnection in advance in writing of the appointment of such agent. A Market Participant participating in the PJM Interchange Energy Market through an agent shall be bound by all of the acts or representations of such agent with respect to transactions in the PJM Interchange Energy Market, and shall ensure that any such agent complies with the requirements of this Agreement.

1.7.4 General Obligations of the Market Participants.

(a) In performing its obligations to the Office of the Interconnection hereunder, each Market Participant shall at all times (i) follow Good Utility Practice, (ii) comply with all applicable laws and regulations, (iii) comply with the applicable principles, guidelines, standards and requirements of FERC, NERC and Applicable Regional Reliability Councils, (iv) comply with the procedures established for operation of the PJM Interchange Energy Market and PJM Region and (v) cooperate with the Office of the Interconnection as necessary for the operation of the PJM Region in a safe, reliable manner consistent with Good Utility Practice.

(b) Market Participants shall undertake all operations in or affecting the PJM Interchange Energy Market and the PJM Region including but not limited to compliance with all Emergency procedures, in accordance with the power and authority of the Office of the Interconnection with respect to the operation of the PJM Interchange Energy Market and the PJM Region as established in this Agreement, and as specified in the Schedules to this Agreement and the PJM Manuals. Failure to comply with the foregoing operational requirements shall subject a Market

Participant to such reasonable charges or other remedies or sanctions for non-compliance as may be established by the PJM Board, including legal or regulatory proceedings as authorized by the PJM Board to enforce the obligations of this Agreement.

(c) The Office of the Interconnection may establish such committees with a representative of each Market Participant, and the Market Participants agree to provide appropriately qualified personnel for such committees, as may be necessary for the Office of the Interconnection and PJMSettlement to perform its obligations hereunder.

(d) All Market Participants shall provide to the Office of the Interconnection the scheduling and other information specified in the Schedules to this Agreement, and such other information as the Office of the Interconnection may reasonably require for the reliable and efficient operation of the PJM Region and PJM Interchange Energy Market, and for compliance with applicable regulatory requirements for posting market and related information. Such information shall be provided as much in advance as possible, but in no event later than the deadlines established by the Schedules to this Agreement, or by the Office of the Interconnection in conformance with such Schedules. Such information shall include, but not be limited to, maintenance and other anticipated outages of generation or transmission facilities, scheduling and related information on bilateral transactions and self-scheduled resources, and implementation of active load management, interruption of load, and other load reduction measures. The Office of the Interconnection shall abide by appropriate requirements for the non-disclosure and protection of any confidential or proprietary information given to the Office of the Interconnection by a Market Participant. Each Market Participant shall maintain or cause to be maintained compatible information and communications systems, as specified by the Office of the Interconnection, required to transmit scheduling, dispatch, or other time-sensitive information to the Office of the Interconnection in a timely manner.

(e) Subject to the requirements for Economic Load Response participants in section 1.5A above, each Market Participant shall install and operate, or shall otherwise arrange for, metering and related equipment capable of recording and transmitting all voice and data communications reasonably necessary for the Office of the Interconnection and PJMSettlement to perform the services specified in this Agreement. A Market Participant that elects to be separately billed for its PJM Interchange shall, to the extent necessary, be individually metered in accordance with Section 14 of this Agreement, or shall agree upon an allocation of PJM Interchange between it and the Market Participant through whose meters the unmetered Market Participant's PJM Interchange is delivered. The Office of the Interconnection shall be notified of the allocation by the foregoing Market Participants.

(f) Each Market Participant shall operate, or shall cause to be operated, any generating resources owned or controlled by such Market Participant that are within the PJM Region or otherwise supplying energy to or through the PJM Region in a manner that is consistent with the standards, requirements or directions of the Office of the Interconnection and that will permit the Office of the Interconnection to perform its obligations under this Agreement; provided, however, no Market Participant shall be required to take any action that is inconsistent with Good Utility Practice or applicable law.

(g) Each Market Participant shall follow the directions of the Office of the Interconnection to take actions to prevent, manage, alleviate or end an Emergency in a manner consistent with this Agreement and the procedures of the PJM Region as specified in the PJM Manuals.

(h) Each Market Participant shall obtain and maintain all permits, licenses or approvals required for the Market Participant to participate in the PJM Interchange Energy Market in the manner contemplated by this Agreement.

(i) Consistent with Section 36.1.1 of the PJM Tariff, to the extent its generating facility is dispatchable, a Market Participant shall submit an Economic Minimum in the Real-time Energy Market that is no greater than the higher of its physical operating minimum or its Capacity Interconnection Rights, as that term is defined in the PJM Tariff, associated with such generating facility under its Interconnection Service Agreement under Attachment O of the PJM Tariff or a wholesale market participation agreement.

1.7.5 Market Operations Center.

Each Market Participant shall maintain a Market Operations Center, or shall make appropriate arrangements for the performance of such services on its behalf. A Market Operations Center shall meet the performance, equipment, communications, staffing and training standards and requirements specified in this Agreement for the scheduling and completion of transactions in the PJM Interchange Energy Market and the maintenance of the reliable operation of the PJM Region, and shall be sufficient to enable (i) a Market Seller or an Economic Load Response Participant to perform all terms and conditions of its offers to the PJM Interchange Energy Market, and (ii) a Market Buyer or an Economic Load Response Participant to conform to the requirements for purchasing from the PJM Interchange Energy Market.

1.7.6 Scheduling and Dispatching.

(a) The Office of the Interconnection shall schedule and dispatch in real-time generation resources and/or Demand Resources economically on the basis of least-cost, security-constrained dispatch and the prices and operating characteristics offered by Market Sellers, continuing until sufficient generation resources and/or Demand Resources are dispatched to serve the PJM Interchange Energy Market energy purchase requirements under normal system conditions of the Market Buyers, as well as the requirements of the PJM Region for ancillary services provided by generation resources and/or Demand Resources, in accordance with this Agreement. Such scheduling and dispatch shall recognize transmission constraints on coordinated flowgates external to the Transmission System in accordance with Appendix A to the Joint Operating Agreement between the Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C. (PJM Rate Schedule FERC No. 38) and on other such flowgates that are coordinated in accordance with agreements between the LLC and other entities. Scheduling and dispatch shall be conducted in accordance with this Agreement.

(b) The Office of the Interconnection shall undertake to identify any conflict or incompatibility between the scheduling or other deadlines or specifications applicable to the PJM Interchange Energy Market, and any relevant procedures of another Control Area, or any tariff

(including the PJM Tariff). Upon determining that any such conflict or incompatibility exists, the Office of the Interconnection shall propose tariff or procedural changes, and undertake such other efforts as may be appropriate, to resolve any such conflict or incompatibility.

(c) To protect its generation or distribution facilities, or local Transmission Facilities not under the monitoring responsibility and dispatch control of the Office of the Interconnection, an entity may request that the Office of the Interconnection schedule and dispatch generation or reductions in demand to meet a limit on Transmission Facilities different from that which the Office of the Interconnection has determined to be required for reliable operation of the Transmission System. To the extent consistent with its other obligations under this Agreement, the Office of the Interconnection shall schedule and dispatch generation and reductions in demand in accordance with such request. An entity that makes a request pursuant to this section 1.7.6(c) shall be responsible for all generation and other costs resulting from its request that would not have been incurred by operating the Transmission System and scheduling and dispatching generation in the manner that the Office of the Interconnection otherwise has determined to be required for reliable operation of the Transmission System.

1.7.7 Pricing.

The price paid for energy bought and sold in the PJM Interchange Energy Market and for demand reductions will reflect the hourly Locational Marginal Price at each load and generation bus, determined by the Office of the Interconnection in accordance with this Agreement. Transmission Congestion Charges and Transmission Loss Charges, which shall be determined by differences in Congestion Prices and Loss Prices in an hour, shall be calculated by the Office of the Interconnection, and collected by PJMSettlement, and the revenues therefrom shall be disbursed by PJMSettlement in accordance with this Schedule.

1.7.8 Generating Market Buyer Resources.

A Generating Market Buyer may elect to self-schedule its generation resources up to that Generating Market Buyer's Equivalent Load, in accordance with and subject to the procedures specified in this Schedule, and the accounting and billing requirements specified in Section 3 to this Schedule. PJMSettlement shall not be a contracting party with respect to such self-scheduled or self-supplied transactions.

1.7.9 Delivery to an External Market Buyer.

A purchase of Spot Market Energy by an External Market Buyer shall be delivered to a bus or buses at the electrical boundaries of the PJM Region specified by the Office of the Interconnection, or to load in such area that is not served by Network Transmission Service, using Point-to-Point Transmission Service paid for by the External Market Buyer. Further delivery of such energy shall be the responsibility of the External Market Buyer.

1.7.10 Other Transactions.

(a) Bilateral Transactions.

- (i) In addition to transactions in the PJM Interchange Energy Market, Market Participants may enter into bilateral contracts for the purchase or sale of electric energy to or from each other or any other entity, subject to the obligations of Market Participants to make Generation Capacity Resources available for dispatch by the Office of the Interconnection. Such bilateral contracts shall be for the physical transfer of energy to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eSchedules and Enhanced Energy Scheduler tools.
- (ii) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of energy to a Market Participant inside the PJM Region, title to the energy that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and the further transmission of the energy or further sale of the energy into the PJM Interchange Energy Market shall be transacted by the buyer under the bilateral contract. With respect to all bilateral contracts for the physical transfer of energy to an entity outside the PJM Region, title to the energy shall pass to the buyer at the border of the PJM Region and shall be delivered to the border using transmission service. In no event shall the purchase and sale of energy between Market Participants under a bilateral contract constitute a transaction in the PJM Interchange Energy Market or be construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.
- (iii) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of energy reported to and coordinated with the Office of the Interconnection under this Schedule shall use all reasonable efforts, consistent with Good Utility Practice, to limit the megawatt hours of such reported transactions to amounts reflecting the expected load and other physical delivery obligations of the buyer under the bilateral contract.
- (iv) All payments and related charges for the energy associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection or PJMSettlement. The LLC, PJMSettlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.
- (v) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any Spot Market Backup used to meet the bilateral contract seller's obligation to deliver energy

under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the Interconnection shall (i) not accept any new eSchedules or Enhanced Energy Scheduler reporting by the Market Participant and (ii) terminate all of the Market Participant's eSchedules and Enhanced Energy Schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the eSchedules and Enhanced Energy Schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection. PJMSettlement shall assign its claims against a seller with respect to a seller's nonpayment for Spot Market Backup to a buyer the extent that the buyer has made an indemnification payment to PJMSettlement with respect to the seller's nonpayment.

- (vi) Bilateral contracts that do not contemplate the physical transfer of energy to or from a Market Participant are not subject to this Schedule, shall not be reported to and coordinated with the Office of the Interconnection, and shall not in any way constitute a transaction in the PJM Interchange Energy Market.

(b) Market Participants shall have Spot Market Backup with respect to all bilateral transactions that contemplate the physical transfer of energy to or from a Market Participant, that are not dynamically scheduled pursuant to Section 1.12 and that are curtailed or interrupted for any reason (except for curtailments or interruptions through active load management for load located within the PJM Region).

(c) To the extent the Office of the Interconnection dispatches a Generating Market Buyer's generation resources, such Generating Market Buyer may elect to net the output of such resources against its hourly Equivalent Load. Such a Generating Market Buyer shall be deemed a buyer from the PJM Interchange Energy Market to the extent of its PJM Interchange Imports, and shall be deemed a seller to the PJM Interchange Energy Market to the extent of its PJM Interchange Exports.

(d) A Market Seller may self-supply Station Power for its generation facility in accordance with the following provisions:

- (i) A Market Seller may self-supply Station Power for its generation facility during any month (1) when the net output of such facility is positive, or (2) when the net output of such facility is negative and the Market Seller during the same month has available at other of its generation facilities

positive net output in an amount at least sufficient to offset fully such negative net output. For purposes of this subsection (d), “net output” of a generation facility during any month means the facility’s gross energy output, less the Station Power requirements of such facility, during that month. The determination of a generation facility’s or a Market Seller’s monthly net output under this subsection (d) will apply only to determine whether the Market Seller self-supplied Station Power during the month and will not affect the price of energy sold or consumed by the Market Seller at any bus during any hour during the month. For each hour when a Market Seller has positive net output and delivers energy into the Transmission System, it will be paid the LMP at its bus for that hour for all of the energy delivered. Conversely, for each hour when a Market Seller has negative net output and has received Station Power from the Transmission System, it will pay the LMP at its bus for that hour for all of the energy consumed.

- (ii) Transmission Provider will determine the extent to which each affected Market Seller during the month self-supplied its Station Power requirements or obtained Station Power from third-party providers (including affiliates) and will incorporate that determination in its accounting and billing for the month. In the event that a Market Seller self-supplies Station Power during any month in the manner described in subsection (1) of subsection (d)(i) above, Market Seller will not use, and will not incur any charges for, transmission service. In the event, and to the extent, that a Market Seller self-supplies Station Power during any month in the manner described in subsection (2) of subsection (d)(i) above (hereafter referred to as “remote self-supply of Station Power”), Market Seller shall use and pay for transmission service for the transmission of energy in an amount equal to the facility’s negative net output from Market Seller’s generation facility(ies) having positive net output. Unless the Market Seller makes other arrangements with Transmission Provider in advance, such transmission service shall be provided under Part II of the PJM Tariff and shall be charged the hourly rate under Schedule 8 of the PJM Tariff for Non-Firm Point-to-Point Transmission Service with an election to pay congestion charges, provided, however, that no reservation shall be necessary for such transmission service and the terms and charges under Schedules 1, 1A, 2 through 6, 9 and 10 of the PJM Tariff shall not apply to such service. The amount of energy that a Market Seller transmits in conjunction with remote self-supply of Station Power will not be affected by any other sales, purchases, or transmission of capacity or energy by or for such Market Seller under any other provisions of the PJM Tariff.
- (iii) A Market Seller may self-supply Station Power from its generation facilities located outside of the PJM Region during any month only if such generation facilities in fact run during such month and Market Seller

separately has reserved transmission service and scheduled delivery of the energy from such resource in advance into the PJM Region.

1.7.11 Emergencies.

(a) The Office of the Interconnection, with the assistance of the Members' dispatchers as it may request, shall be responsible for monitoring the operation of the PJM Region, for declaring the existence of an Emergency, and for directing the operations of Market Participants as necessary to manage, alleviate or end an Emergency. The standards, policies and procedures of the Office of the Interconnection for declaring the existence of an Emergency, including but not limited to a Minimum Generation Emergency, and for managing, alleviating or ending an Emergency, shall apply to all Members on a non-discriminatory basis. Actions by the Office of the Interconnection and the Market Participants shall be carried out in accordance with this Agreement, the NERC Operating Policies, Applicable Regional Reliability Council reliability principles and standards, Good Utility Practice, and the PJM Manuals. A declaration that an Emergency exists or is likely to exist by the Office of the Interconnection shall be binding on all Market Participants until the Office of the Interconnection announces that the actual or threatened Emergency no longer exists. Consistent with existing contracts, all Market Participants shall comply with all directions from the Office of the Interconnection for the purpose of managing, alleviating or ending an Emergency. The Market Participants shall authorize the Office of the Interconnection and PJMSettlement to purchase or sell energy on their behalf to meet an Emergency, and otherwise to implement agreements with other Control Areas interconnected with the PJM Region for the mutual provision of service to meet an Emergency, in accordance with this Agreement.

(b) To the extent load must be shed to alleviate an Emergency in a Control Zone, the Office of the Interconnection shall, to the maximum extent practicable, direct the shedding of load within such Control Zone. The Office of the Interconnection may shed load in one Control Zone to alleviate an Emergency in another Control Zone under its control only as necessary after having first shed load to the maximum extent practicable in the Control Zone experiencing the Emergency and only to the extent that PJM supports other control areas (not under its control) in those situations where load shedding would be necessary, such as to prevent isolation of facilities within the Eastern Interconnection, to prevent voltage collapse, or to restore system frequency following a system collapse; provided, however, that the Office of the Interconnection may not order a manual load dump in a Control Zone solely to address capacity deficiencies in another Control Zone. This subsection shall be implemented consistent with North American Electric Reliability Council and applicable reliability council standards.

1.7.12 Fees and Charges.

Each Market Participant, except for Special Members, shall pay all fees and charges of the Office of the Interconnection for operation of the PJM Interchange Energy Market as determined by and allocated to the Market Participant by the Office of the Interconnection in accordance with Schedule 3.

1.7.13 Relationship to the PJM Region.

The PJM Interchange Energy Market operates within and subject to the requirements for the operation of the PJM Region.

1.7.14 PJM Manuals.

The Office of the Interconnection shall be responsible for maintaining, updating, and promulgating the PJM Manuals as they relate to the operation of the PJM Interchange Energy Market. The PJM Manuals, as they relate to the operation of the PJM Interchange Energy Market, shall conform and comply with this Agreement, NERC operating policies, and Applicable Regional Reliability Council reliability principles, guidelines and standards, and shall be designed to facilitate administration of an efficient energy market within industry reliability standards and the physical capabilities of the PJM Region.

1.7.15 Corrective Action.

Consistent with Good Utility Practice, the Office of the Interconnection shall be authorized to direct or coordinate corrective action, whether or not specified in the PJM Manuals, as necessary to alleviate unusual conditions that threaten the integrity or reliability of the PJM Region, or the regional power system.

1.7.16 Recording.

Subject to the requirements of applicable State or federal law, all voice communications with the Office of the Interconnection Control Center may be recorded by the Office of the Interconnection and any Market Participant communicating with the Office of the Interconnection Control Center, and each Market Participant hereby consents to such recording.

1.7.17 Operating Reserves.

(a) The following procedures shall apply to any generation unit subject to the dispatch of the Office of the Interconnection for which construction commenced before July 9, 1996, or any Demand Resource subject to the dispatch of the Office of the Interconnection.

(b) The Office of the Interconnection shall schedule to the Operating Reserve and load-following objectives of the Control Zones of the PJM Region and the PJM Interchange Energy Market in scheduling generation resources and/or Demand Resources pursuant to this Schedule. A table of Operating Reserve objectives for each Control Zone is calculated and published annually in the PJM Manuals. Reserve levels are probabilistically determined based on the season's historical load forecasting error and forced outage rates.

(c) Nuclear generation resources shall not be eligible for Operating Reserve payments unless: 1) the Office of the Interconnection directs such resources to reduce output, in which case, such units shall be compensated in accordance with section 3.2.3(f) of this Schedule; or 2) the resource submits a request for a risk premium to the Market Monitoring Unit under the procedures specified in Section II.B of Attachment M - Appendix. A nuclear generation

resource (i) must submit a risk premium consistent with its agreement under such process, or, (ii) if it has not agreed with the Market Monitoring Unit on an appropriate risk premium, may submit its own determination of an appropriate risk premium to the Office of the Interconnection, subject to acceptance by the Office of the Interconnection, with or without prior approval from the Commission.

(d) PJMSettlement shall be the Counterparty to the purchases and sales of Operating Reserve in the PJM Interchange Energy Market.

1.7.18 Regulation.

(a) Regulation to meet the Regulation objective of each Regulation Zone shall be supplied from generation resources and/or Demand Resources located within the metered electrical boundaries of such Regulation Zone. Generating Market Buyers, and Market Sellers offering Regulation, shall comply with applicable standards and requirements for Regulation capability and dispatch specified in the PJM Manuals.

(b) The Office of the Interconnection shall obtain and maintain for each Regulation Zone an amount of Regulation equal to the Regulation objective for such Regulation Zone as specified in the PJM Manuals.

(c) The Regulation range of a generation unit or Demand Resource shall be at least twice the amount of Regulation assigned.

(d) A generation unit capable of automatic energy dispatch that is also providing Regulation shall have its energy dispatch range reduced by twice the amount of the Regulation provided. The amount of Regulation provided by a generation unit shall serve to redefine the Normal Minimum Generation and Normal Maximum Generation energy limits of that generation unit, in that the amount of Regulation shall be added to the generation unit's Normal Minimum Generation energy limit, and subtracted from its Normal Maximum Generation energy limit.

(e) Qualified Regulation must satisfy the verification tests described in the PJM Manuals.

1.7.19 Ramping.

A generator dispatched by the Office of the Interconnection pursuant to a control signal appropriate to increase or decrease the generator's megawatt output level shall be able to change output at the ramping rate specified in the Offer Data submitted to the Office of the Interconnection for that generator.

1.7.19A Synchronized Reserve.

(a) Synchronized Reserve shall be supplied from generation resources and/or Demand Resources located within the metered boundaries of the PJM Region. Generating Market Buyers, and Market Sellers offering Synchronized Reserve shall comply with applicable

standards and requirements for Synchronized Reserve capability and dispatch specified in the PJM Manuals.

(b) The Office of the Interconnection shall obtain and maintain for each Synchronized Reserve Zone an amount of Synchronized Reserve equal to the Synchronized Reserve objective for such Synchronized Reserve Zone, as specified in the PJM Manuals.

(c) The Synchronized Reserve capability of a generation resource and Demand Resource shall be the increase in energy output or load reduction achievable by the generation resource and Demand Resource within a continuous 10-minute period.

(d) A generation unit capable of automatic energy dispatch that also is providing Synchronized Reserve shall have its energy dispatch range reduced by the amount of the Synchronized Reserve provided. The amount of Synchronized Reserve provided by a generation unit shall serve to redefine the Normal Maximum Generation energy limit of that generation unit in that the amount of Synchronized Reserve provided shall be subtracted from its Normal Maximum Generation energy limit.

1.7.19B Bilateral Transactions Regarding Regulation, Synchronized Reserve and Day-ahead Scheduling Reserves.

(a) In addition to transactions in the Regulation market, Synchronized Reserve market, and Day-ahead Scheduling Reserves Market, Market Participants may enter into bilateral contracts for the purchase or sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from each other or any other entity. Such bilateral contracts shall be for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant and shall be reported to and coordinated with the Office of the Interconnection in accordance with this Schedule and pursuant to the LLC's rules relating to its eMarket tools.

(b) For purposes of clarity, with respect to all bilateral contracts for the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to a Market Participant in the PJM Region, title to the product that is the subject of the bilateral contract shall pass to the buyer at the source specified for the bilateral contract, and any further transactions associated with such products or further sale of such Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves in the markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, respectively, shall be transacted by the buyer under the bilateral contract. In no event shall the purchase and sale of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves between Market Participants under a bilateral contract constitute a transaction in PJM's markets for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves, or otherwise construed to define PJMSettlement as a contracting party to any bilateral transactions between Market Participants.

(c) Market Participants that are parties to bilateral contracts for the purchase and sale and physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves reported to and coordinated with the Office of the Interconnection under this Schedule shall use

all reasonable efforts, consistent with Good Utility Practice, to limit the amounts of such reported transactions to amounts reflecting the expected requirements for Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves of the buyer pursuant to such bilateral contracts.

(d) All payments and related charges for the Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves associated with a bilateral contract shall be arranged between the parties to the bilateral contract and shall not be billed or settled by the Office of the Interconnection. The LLC, PJM Settlement, and the Members will not assume financial responsibility for the failure of a party to perform obligations owed to the other party under a bilateral contract reported and coordinated with the Office of the Interconnection under this Schedule.

(e) A buyer under a bilateral contract shall guarantee and indemnify the LLC, PJMSettlement, and the Members for the costs of any purchases by the seller under the bilateral contract in the markets for Regulations, Synchronized Reserve, or Day-ahead Scheduling Reserves used to meet the bilateral contract seller's obligation to deliver Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves under the bilateral contract and for which payment is not made to PJMSettlement by the seller under the bilateral contract, as determined by the Office of the Interconnection. Upon any default in obligations to the LLC or PJMSettlement by a Market Participant, the Office of the Interconnection shall (i) not accept any new eMarket reporting by the Market Participant and (ii) terminate all of the Market Participant's reporting of eMarkets schedules associated with its bilateral contracts previously reported to the Office of the Interconnection for all days where delivery has not yet occurred. All claims regarding a buyer's default to a seller under a bilateral contract shall be resolved solely between the buyer and the seller. In such circumstances, the seller may instruct the Office of the Interconnection to terminate all of the reported eMarkets schedules associated with bilateral contracts between buyer and seller previously reported to the Office of the Interconnection.

(f) Market Participants shall purchase Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves from PJM's markets for Regulation, Synchronized Reserve, Day-ahead Scheduling Reserves, in quantities sufficient to complete the delivery or receipt obligations of a bilateral contract that has been curtailed or interrupted for any reason, with respect to all bilateral transactions that contemplate the physical transfer of Regulation, Synchronized Reserve, or Day-ahead Scheduling Reserves to or from a Market Participant.

1.7.20 Communication and Operating Requirements.

(a) Market Participants. Each Market Participant shall have, or shall arrange to have, its transactions in the PJM Interchange Energy Market subject to control by a Market Operations Center, with staffing and communications systems capable of real-time communication with the Office of the Interconnection during normal and Emergency conditions and of control of the Market Participant's relevant load or facilities sufficient to meet the requirements of the Market Participant's transactions with the PJM Interchange Energy Market, including but not limited to the following requirements as applicable.

(b) Market Sellers selling from generation resources and/or Demand Resources within the PJM Region shall: report to the Office of the Interconnection sources of energy and Demand Resources available for operation; supply to the Office of the Interconnection all applicable Offer Data; report to the Office of the Interconnection generation resources ~~and Demand Resources~~ that are self-scheduled; with respect to generation resources, report to the Office of the Interconnection bilateral sales transactions to buyers not within the PJM Region; confirm to the Office of the Interconnection bilateral sales to Market Buyers within the PJM Region; respond to the Office of the Interconnection's directives to start, shutdown or change output levels of generation units, or change scheduled voltages or reactive output levels of generation units, or reduce load from Demand Resources; continuously maintain all Offer Data concurrent with on-line operating information; and ensure that, where so equipped, generating equipment and Demand Resources are operated with control equipment functioning as specified in the PJM Manuals.

(c) Market Sellers selling from generation resources outside the PJM Region shall: provide to the Office of the Interconnection all applicable Offer Data, including offers specifying amounts of energy available, hours of availability and prices of energy and other services; respond to Office of the Interconnection directives to schedule delivery or change delivery schedules; and communicate delivery schedules to the Market Seller's Control Area.

(d) Market Participants that are Load Serving Entities or purchasing on behalf of Load Serving Entities shall: respond to Office of the Interconnection directives for load management steps; report to the Office of the Interconnection Generation Capacity Resources to satisfy capacity obligations that are available for pool operation; report to the Office of the Interconnection all bilateral purchase transactions; respond to other Office of the Interconnection directives such as those required during Emergency operation.

(e) Market Participants that are not Load Serving Entities or purchasing on behalf of Load Serving Entities shall: provide to the Office of the Interconnection requests to purchase specified amounts of energy for each hour of the Operating Day during which it intends to purchase from the PJM Interchange Energy Market, along with Dispatch Rate levels above which it does not desire to purchase; respond to other Office of the Interconnection directives such as those required during Emergency operation.

(f) Economic Load Response Participants are responsible for maintaining demand reduction information, including the amount and price at which demand may be reduced. The Economic Load Response Participant shall provide this information to the Office of the Interconnection by posting it on the Load Response Program Registration link of the PJM website as required by the PJM Manuals. The Economic Load Response Participant shall notify the Office of the Interconnection of a demand reduction concurrent with, or prior to, the beginning of such demand reduction in accordance with the PJM Manuals. In the event that an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer that would affect a relevant Customer Baseline Load as required by the PJM Manuals.

2.2 General.

The Office of the Interconnection shall determine the least cost security-constrained dispatch, which is the least costly means of serving load at different locations in the PJM Region based on actual operating conditions existing on the power grid (including transmission constraints on external coordinated flowgates to the extent provided by section 1.7.6) and on the prices at which Market Sellers have offered to supply energy and offers by Economic Load Response Participants to reduce demand that qualify to set Locational Marginal Prices in the PJM Interchange Energy Market. Locational Marginal Prices for the generation and load buses in the PJM Region, including interconnections with other Control Areas, will be calculated based on the actual economic dispatch and the prices of energy and demand reduction offers. The process for the determination of Locational Marginal Prices shall be as follows:

(a) To determine actual operating conditions on the power grid in the PJM Region, the Office of the Interconnection shall use a computer model of the interconnected grid that uses available metered inputs regarding generator output, loads, and power flows to model remaining flows and conditions, producing a consistent representation of power flows on the network. The computer model employed for this purpose, referred to as the State Estimator program, is a standard industry tool and is described in Section 2.3 below. It will be used to obtain information regarding the output of generation supplying energy to the PJM Region, loads at buses in the PJM Region, transmission losses, and power flows on binding transmission constraints for use in the calculation of Locational Marginal Prices. Additional information used in the calculation, including Dispatch Rates and real time schedules for external transactions between PJM and other Control Areas and dispatch and pricing information from entities with whom PJM has executed a joint operating agreement, will be obtained from the Office of the Interconnection's dispatchers.

(b) Using the prices at which energy is offered by Market Sellers and demand reductions are offered by Economic Load Response Participants to the PJM Interchange Energy Market, the Office of the Interconnection shall determine the offers of energy and demand reductions that will be considered in the calculation of Locational Marginal Prices. As described in Section 2.4 below, every qualified offer for demand reduction and of energy by a Market Seller from resources that are following economic dispatch instructions of the Office of the Interconnection will be utilized in the calculation of Locational Marginal Prices, including, without limitation, qualified offers from Economic Load Response Participants in either the Day-Ahead or Real-Time Energy Markets that satisfy the Net Benefits Test. Offers of demand reduction from Demand Resources in the Real-time Energy Market will not be eligible to set Locational Marginal Prices, unless metered directly by the Office of the Interconnection.

(c) Based on the system conditions on the PJM power grid, determined as described in (a), and the eligible energy and demand reduction offers, determined as described in (b), the Office of the Interconnection shall determine the least costly means of obtaining energy to serve the next increment of load at each bus in the PJM Region, in the manner described in Section 2.5 below. The result of that calculation shall be a set of Locational Marginal Prices based on the system conditions at the time.

3.2 Market Buyers.

3.2.1 Spot Market Energy Charges.

(a) The Office of the Interconnection shall calculate System Energy Prices in the form of Day-ahead System Energy Prices and Real-time System Energy Prices for the PJM Region, in accordance with Section 2 of this Schedule.

(b) Market Buyers shall be charged for all load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) scheduled to be served from the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price.

(c) Generating Market Buyers shall be paid for all energy scheduled to be delivered to the PJM Interchange Energy Market in the Day-ahead Energy Market at the Day-ahead System Energy Price.

(d) At the end of each hour during an Operating Day, the Office of the Interconnection shall calculate the total amount of net hourly PJM Interchange for each Market Buyer, including Generating Market Buyers, in accordance with the PJM Manuals. For Internal Market Buyers that are Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall include determination of the net energy flows from: (i) tie lines; (ii) any generation resource the output of which is controlled by the Market Buyer but delivered to it over another entity's Transmission Facilities; (iii) any generation resource the output of which is controlled by another entity but which is directly interconnected with the Market Buyer's transmission system; (iv) deliveries pursuant to bilateral energy sales; (v) receipts pursuant to bilateral energy purchases; and (vi) an adjustment to account for the day-ahead PJM Interchange, calculated as the difference between scheduled withdrawals and injections by that Market Buyer in the Day-ahead Energy Market. For External Market Buyers and Internal Market Buyers that are not Load Serving Entities or purchasing on behalf of Load Serving Entities, this calculation shall determine the energy scheduled hourly for delivery to the Market Buyer net of the amounts scheduled by the External Market Buyer in the Day-ahead Energy Market.

(e) An Internal Market Buyer shall be charged for Spot Market Energy purchases to the extent of its hourly net purchases from the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. An External Market Buyer shall be charged for its Spot Market Energy purchases based on the energy delivered to it, determined as specified in Section 3.2.1(d) above. The total charge shall be determined by the product of the hourly net amount of PJM Interchange Imports times the hourly Real-time System Energy Price for that Market Buyer.

(f) A Generating Market Buyer shall be paid as a Market Seller for sales of Spot Market Energy to the extent of its hourly net sales into the PJM Interchange Energy Market, determined as specified in Section 3.2.1(d) above. The total payment shall be determined by the product of the hourly net amount of PJM Interchange Exports times the hourly Real-time System Energy Price for that Market Seller.

3.2.2 Regulation.

(a) Each Internal Market Buyer that is a Load Serving Entity in a Regulation Zone shall have an hourly Regulation objective equal to its pro rata share of the Regulation requirements of such Regulation Zone for the hour, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Regulation Zone for the hour ("Regulation Obligation"). An Internal Market Buyer that does not meet its hourly Regulation obligation shall be charged for Regulation dispatched by the Office of the Interconnection to meet such obligation at the Regulation market-clearing price determined in accordance with subsection (c) of this Section, plus the amounts, if any, described in subsection (f) of this section.

(b) A Generating Market Buyer supplying Regulation in a Regulation Zone at the direction of the Office of the Interconnection in excess of its hourly Regulation obligation shall be credited for each increment of such Regulation at the higher of (i) the Regulation market-clearing price in such Regulation Zone or (ii) the sum of the regulation offer and the unit-specific opportunity cost of the generation resource supplying the increment of Regulation, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(c) The Regulation market-clearing price in each Regulation Zone shall be determined at a time to be determined by the Office of the Interconnection which shall be no earlier than the day before the Operating Day. The market-clearing price for each regulating hour shall be equal to the highest sum of a resource's Regulation offer plus its estimated unit-specific opportunity costs, determined as described in subsection (d) below from among the resources selected to provide Regulation. A resource's Regulation offer by any Market Seller that fails the three-pivotal supplier test set forth in section 3.3.2A.1 of this Schedule shall not exceed the cost of providing Regulation from such resource, plus twelve dollars, as determined pursuant to the formula in section 1.10.1A(e) of this Schedule.

(d) In determining the Regulation market-clearing price for each Regulation Zone, the estimated unit-specific opportunity costs of a generation resource offering to sell Regulation in each regulating hour shall be equal to the sum of the unit-specific opportunity costs (i) incurred during the hour in which the obligation is fulfilled, plus costs (ii) associated with uneconomic operation during the hour preceding the initial regulating hour ("preceding shoulder hour"), plus costs (iii) associated with uneconomic operation during the hour after the final regulating hour ("following shoulder hour").

The unit-specific opportunity costs incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the set point of the generation resource that is expected to be required in order to provide Regulation from the generation resource's expected output level if it had been dispatched in economic merit order times (ii) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource) in the PJM Interchange Energy Market.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the preceding shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the following shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the following shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market.

Estimated opportunity costs for Demand Resources to provide Regulation are zero.

(e) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Regulation in a Regulation Zone and that actively follows the Office of the Interconnection's Regulation signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Regulation, and for the percentage of the preceding shoulder hour and the following shoulder hour during which the Generating Market Buyer or Market Seller provided Regulation. The unit-specific opportunity cost incurred during the hour in which the Regulation obligation is fulfilled shall be equal to the product of (i) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's Regulation signals from the generation resource's expected output level if it had been dispatched in economic merit order times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the actual megawatt level of the resource when the actual megawatt level is within the tolerance defined in the PJM Manuals for the Regulation set point, or at the Regulation set point for the

resource when it is not within the corresponding tolerance) in the PJM Interchange Energy Market. Opportunity costs for Demand Resources to provide Regulation are zero.

The unit-specific opportunity costs associated with uneconomic operation during the preceding shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the initial regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the preceding shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the preceding shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in the initial regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the preceding shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

The unit-specific opportunity costs associated with uneconomic operation during the following shoulder hour shall be equal to the product of (i) the deviation between the set point of the generation resource that is expected to be required in the final regulating hour in order to provide Regulation and the lesser of the resource's actual or expected output in the following shoulder hour when the resource is requested at a lower output than what is otherwise economic in order to provide Regulation, or, the higher of the resource's actual or expected output in the following shoulder hour when the resource is requested at a higher output than what is otherwise economic in order to provide Regulation, times (ii) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource in the following shoulder hour and the lesser of the available market-based or highest available cost-based energy offer from the generation resource (at the megawatt level of the Regulation set point for the resource in final regulating hour) in the PJM Interchange Energy Market, times (iii) the percentage of the following shoulder hour during which the deviation was incurred, all as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.

(f) Any amounts credited for Regulation in an hour in excess of the Regulation market-clearing price in that hour shall be allocated and charged to each Internal Market Buyer in a Regulation Zone that does not meet its hourly Regulation obligation in proportion to its purchases of Regulation in such Regulation Zone in megawatt-hours during that hour.

3.2.2A Offer Price Caps.

3.2.2A.1 Applicability.

(a) Each hour, the Office of the Interconnection shall conduct a three-pivotal supplier test as described in this section. Regulation offers from Market Sellers that fail the three-pivotal

supplier test shall be capped in the hour in which they failed the test at their cost based offers as determined pursuant to section 1.10.1A(e) of this Schedule. A Regulation supplier fails the three-pivotal supplier test in any hour in which such Regulation supplier and the two largest other Regulation suppliers are jointly pivotal.

(b) For the purposes of conducting the three-pivotal supplier test pursuant to this section, the following applies:

- (i) The three-pivotal supplier test will include in the definition of available supply all offers from resources capable of satisfying the Regulation requirement of the PJM Region for which the cost-based offer plus any eligible opportunity costs is no greater than 150 percent of the clearing price that would be calculated if all offers were limited to cost (plus eligible opportunity costs).
- (ii) The three-pivotal supplier test will apply on a Regulation supplier basis (i.e. not a resource by resource basis) and only the Regulation suppliers that fail the three-pivotal supplier test will have their Regulation offers capped. A Regulation supplier for the purposes of this section includes corporate affiliates. Regulation from resources controlled by a Regulation supplier or its affiliates, whether by contract with unaffiliated third parties or otherwise, will be included as Regulation of that Regulation supplier. Regulation provided by resources owned by a Regulation supplier but controlled by an unaffiliated third party, whether by contract or otherwise, will be included as Regulation of that third party.

3.2.3 Operating Reserves.

(a) A Market Seller's pool-scheduled resources capable of providing Operating Reserves shall be credited as specified below based on the prices offered for the operation of such resource, provided that the resource was available for the entire time specified in the Offer Data for such resource. To the extent that Section 3.2.A.01 of Schedule 1 of this Agreement does not meet the Day-ahead Scheduling Reserves Requirement, the Office of the Interconnection shall schedule additional Operating Reserves pursuant to Section 1.7.17 and 1.10 of Schedule 1 of this Agreement. In addition the Office of the Interconnection shall schedule Operating Reserves pursuant to those sections to satisfy any unforeseen Operating Reserve requirements that are not reflected in the Day-ahead Scheduling Reserves Requirement.

(b) The following determination shall be made for each pool-scheduled resource that is scheduled in the Day-ahead Energy Market: the total offered price for start-up and no-load fees and energy, determined on the basis of the resource's scheduled output, shall be compared to the total value of that resource's energy – as determined by the Day-ahead Energy Market and the Day-ahead Prices applicable to the relevant generation bus in the Day-ahead Energy Market. Except as provided in Section 3.2.3(n), if the total offered price summed over all hours exceeds the total value summed over all hours, the difference shall be credited to the Market Seller. The Office of the Interconnection shall apply any balancing Operating Reserve credits allocated

pursuant to this Section 3.2.3(b) to real-time deviations from day-ahead schedules or real-time load share plus exports, pursuant to Section 3.2.3(p), depending on whether the balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

- (i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve credits shall be allocated based on the reason the resource was scheduled according to the following provisions:

- (A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve credits, identified as RA Credits for Deviations, shall be allocated to real-time deviations from day-ahead schedules.

- (B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve credits, identified as RA Credits for Reliability, shall be allocated according to ratio share of real time load plus export transactions.

- (C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve credits shall be segmented and separately allocated pursuant to subsections 3.2.3(b)(i)(A) or 3.2.3(b)(i)(B) hereof. Balancing Operating Reserve credits for such resources will be identified in the same manner as units committed during the reliability analysis pursuant to subsections 3.2.3(b)(i)(A) and 3.2.3(b)(i)(B) hereof.

- (ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve credits shall be allocated according to the following provisions:

- (A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve credits, identified as RT Credits for Reliability, shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, credits will be applied pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the

resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the credits for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category (RT Credits for Reliability or RT Credits for Deviations) as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(b)(ii)(A) hereof to operate in real-time during an Operating Day, the associated balancing Operating Reserve credits, identified as RT Credits for Deviations, shall be allocated according to real-time deviations from day-ahead schedules.

(iii) PJM shall post on its Web site the aggregate amount of MWs committed that meet the criteria referenced in subsections (b)(i) and (b)(ii) hereof.

(c) The sum of the foregoing credits calculated in accordance with Section 3.2.3(b) plus any unallocated charges from Section 3.2.3(h) and 5.1.7, and any shortfalls paid pursuant to the Market Settlement provision of the Day-ahead Economic Load Response Program shall be the cost of Operating Reserves in the Day-ahead Energy Market.

(d) The cost of Operating Reserves in the Day-ahead Energy Market shall be allocated and charged to each Market Participant in proportion to the sum of its (i) scheduled load (net of Behind The Meter Generation expected to be operating, but not to be less than zero) and accepted Decrement Bids in the Day-ahead Energy Market in megawatt-hours for that Operating Day; and (ii) scheduled energy sales in the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours for that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such area pursuant to Section 1.12.

(e) At the end of each Operating Day, the following determination shall be made for each synchronized pool-scheduled resource of each Market Seller that operates as requested by the Office of the Interconnection and that is not committed solely for the purpose of providing Synchronized Reserve: For each calendar day, pool-scheduled resources in the Real-time Energy Market shall be made whole for each of the following segments: 1) the greater of their day-ahead schedules or minimum run time (minimum down time for Demand Resources); and 2) any block of hours the resource operates at PJM's direction in excess of the greater of its day-ahead schedule or minimum run time (minimum down time for Demand Resources). For each calendar day, and for each synchronized start of a generation resource or PJM-dispatched economic load reduction, there will be a maximum of two segments for each resource. Segment 1 will be the greater of the day-ahead schedule and minimum run time (minimum down time for Demand Resources) and Segment 2 will include the remainder of the contiguous hours when the resource is operating at the direction of the Office of the Interconnection, provided that a segment is limited to the Operating Day in which it commenced and cannot include any part of the following Operating Day.

Credits received pursuant to this section shall be equal to the positive difference between a resource's total offered price for start-up (shutdown costs for Demand Resources) and no-load fees and energy, determined on the basis of the resource's scheduled output, and the total value of the resource's energy as determined by the Real-time Energy Market and the real-time LMP(s) applicable to the relevant generation bus in the Real-time Energy Market. The foregoing notwithstanding, credits for segment 2 shall exclude start up (shutdown costs for Demand Resources) costs for generation resources.

Except as provided in Section 3.2.3(m), if the total offered price exceeds the total value, the difference less any credit as determined pursuant to Section 3.2.3(b) plus the resource's opportunity cost and less any amounts credited for Synchronized Reserve in excess of the Synchronized Reserve offer plus the resource's opportunity cost and less any amounts credited for providing Reactive Services as specified in Section 3.2.3B, and less any amounts for Day-ahead Scheduling Reserve in excess of the Day-ahead Scheduling Reserve offer plus the resource's opportunity cost, shall be credited to the Market Seller.

Synchronized Reserve and Day-ahead Scheduling Reserve credits applied against Operating Reserve credits pursuant to this section shall be netted against the Operating Reserve credits earned in the corresponding hour(s) in which the Synchronized Reserve and Day-ahead Scheduling Reserve credits accrued, provided that for condensing combustion turbines, Synchronized Reserve credits will be netted against the total Operating Reserve credits accrued during each period the unit operates in condensing and generation mode for one or more contiguous hours.

(f) A Market Seller's steam-electric generating unit or combined cycle unit operating in combined cycle mode that is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is reduced or suspended at the request of the Office of the Interconnection due to a transmission constraint or other reliability issue, and for which the hourly integrated, real-time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall be credited hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$, where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended, determined according to the real-time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer

associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(f-1) A Market Seller's combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

- (i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the unit's offer corresponding to the level of output requested by the Office of the Interconnection (as directed by the PJM dispatcher), then the Market Seller shall be credited in a manner consistent with that described above for a steam unit or combined cycle unit operating in combined cycle mode.
- (ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

$URTLMP$ equals the real time LMP at the unit's bus;

$UDALMP$ equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit, determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price schedule is less than the cost-based offer provided for the unit, in which case the offer for the unit will be determined from the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(f-2) A Market Seller's hydroelectric resource that is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), the output of which is altered at the request of the Office of the Interconnection from the schedule submitted by the owner, due to a transmission constraint or other reliability issue, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(f-3) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for opportunity cost associated with following PJM dispatch instructions and reducing or suspending a unit's output due to a transmission constraint or other reliability issue, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of opportunity cost compensation, the Office of the Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit disagrees with the modified amount of opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(g) The sum of the foregoing credits, plus any cancellation fees paid in accordance with Section 1.10.2(d), such cancellation fees to be applied to the Operating Day for which the unit was scheduled, plus any shortfalls paid pursuant to the Market Settlement provision of the real-time Economic Load Response Program, less any payments received from another Control Area for Operating Reserves, plus any redispatch costs incurred in accordance with section 10(a) of this Schedule, shall be the cost of Operating Reserves for the Real-time Energy Market in each Operating Day.

(h) The cost of Operating Reserves for the Real-time Energy Market for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of the absolute values of its (i) load deviations (net of operating Behind The Meter Generation) from the Day-ahead Energy Market in megawatt-hours during that Operating Day; (ii) generation deviations (not including deviations in Behind The Meter Generation) from the Day-ahead Energy Market for non-dispatchable generation resources, including External Resources, in megawatt-hours during the Operating Day; (iii) deviations from the Day-ahead Energy Market for bilateral transactions from outside the PJM Region for delivery within such region in megawatt-hours during the Operating Day, except as noted below and in the PJM Manuals; and (iv) deviations of energy sales from the Day-ahead Energy Market from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such region pursuant to Section 1.12.

Deviations that occur within a single Zone shall be associated with the Eastern or Western Region, as defined in Section 3.2.3(q) of this Schedule, and shall be subject to the regional balancing Operating Reserve rate determined in accordance with Section 3.2.3(q). Deviations at interfaces and hubs shall be associated with the Eastern or Western Region if all the busses that define all interfaces or all hubs are located in the region. If deviations at interfaces and hubs are associated with the Eastern or Western region, they shall be subject to the regional balancing Operating Reserve rate. Demand and supply deviations shall be based on total activity in a Zone, including all aggregates and hubs defined by busses that are wholly contained within the same Zone.

The foregoing notwithstanding, netting deviations shall be allowed in accordance with the following provisions:

- (i) Generation resources with multiple units located at a single bus shall be able to offset deviations in accordance with the PJM Manuals to determine the net deviation MW at the relevant bus.
- (ii) Demand deviations will be assessed by comparing all day-ahead demand transactions at a single transmission zone, hub, or interface against the real-time demand transactions at that same transmission zone, hub, or interface; except that the positive values of demand deviations, as set forth in the PJM Manuals, will not be assessed Operating Reserve charges in the event of an Operating Reserve shortage in real-time or where PJM initiates the request for load reductions in real-time in order to avoid an Operating Reserve shortage as described in this Schedule, Section 6A, Scarcity Pricing.
- (iii) Supply deviations will be assessed by comparing all day-ahead transactions at a single transmission zone, hub, or interface against the real-time transactions at that same transmission zone, hub, or interface.

(i) At the end of each Operating Day, Market Sellers shall be credited on the basis of their offered prices for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, as well as the credits calculated as specified in Section 3.2.3(b) for those generators committed solely for the purpose of providing synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, at the request of the Office of the Interconnection.

(j) The sum of the foregoing credits as specified in Section 3.2.3(i) shall be the cost of Operating Reserves for synchronous condensing for the PJM Region for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for the Operating Day and shall be separately determined for each Control Zone of the PJM Region based on the Control Zone to which the resource was synchronized to provide synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation.

(k) The cost of Operating Reserves for synchronous condensing for purposes other than providing Synchronized Reserve or Reactive Services, or in association with post-contingency operation for each Operating Day shall be allocated and charged to each Market Participant in proportion to the sum of its (i) deliveries of energy to load (net of operating Behind The Meter Generation, but not to be less than zero) in the PJM Region, served under Network Transmission Service, in megawatt-hours during that Operating Day; and (ii) deliveries of energy sales from within the PJM Region to load outside such region in megawatt-hours during that Operating Day, but not including its bilateral transactions that are dynamically scheduled to load outside such Control Zone pursuant to Section 1.12, as compared to the sum of all such deliveries for all Market Participants.

(l) For any Operating Day in either, as applicable, the Day-ahead Energy Market or the Real-time Energy Market for which, for all or any part of such Operating Day, the Office of the Interconnection: (i) declares a Maximum Generation Emergency; (ii) issues an alert that a Maximum Generation Emergency may be declared (“Maximum Generation Emergency Alert”); or (iii) schedules units based on the anticipation of a Maximum Generation Emergency or a Maximum Generation Emergency Alert, the Operating Reserves credit otherwise provided by Section 3.2.3.(b) or Section 3.2.3(e) in connection with marked-based offers shall be limited as provided in subsections (n) or (m), respectively. The Office of the Interconnection shall provide timely notice on its internet site of the commencement and termination of any of the actions described in subsection (i), (ii), or (iii) of this subsection (l) (collectively referred to as “MaxGen Conditions”). Following the posting of notice of the commencement of a MaxGen Condition, a Market Seller may elect to submit a cost-based offer in accordance with Schedule 2 of the Operating Agreement, in which case subsections (m) and (n) shall not apply to such offer; provided, however, that such offer must be submitted in accordance with the deadlines in Section 1.10 for the submission of offers in the Day-ahead Energy Market or Real-time Energy Market, as applicable. Submission of a cost-based offer under such conditions shall not be precluded by Section 1.9.7(b); provided, however, that the Market Seller must return to compliance with Section 1.9.7(b) when it submits its bid for the first Operating Day after termination of the MaxGen Condition.

(m) For the Real-time Energy Market, if the Effective Offer Price (as defined below) for a market-based offer is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. For purposes of this subsection (m), the Effective Offer Price shall be the amount that, absent subsections (l) and (m), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(e) plus the Real-time Energy Market revenues for the hours that the offer is economic divided by the megawatt hours of energy provided during the hours that the offer is economic. The hours that the offer is economic shall be: (i) the hours that the offer price for energy is less than or equal to the Real-time Price for the relevant generation bus, (ii) the hours in which the offer for energy is greater than Locational Marginal Price and the unit is operated at the direction of the Office of the Interconnection that are in addition to any hours required due to the minimum run time or other operating constraint of the unit, and (iii) for any unit with a minimum run time of one hour or less and with more than one start available per day, any hours the unit operated at the direction of the Office of the Interconnection.

(n) For the Day-ahead Energy Market, if notice of a MaxGen Condition is provided prior to 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall not receive any credit for Operating Reserves. If notice of a MaxGen Condition is provided after 12:00 noon on the day before the Operating Day for which transactions are being scheduled and the Effective Offer Price is greater than \$1,000/MWh, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. If the Effective Offer Price is less than or equal to \$1,000/MWh, regardless of when notice of a MaxGen Condition is provided, the Market Seller shall receive credit for Operating Reserves determined in accordance with Section 3.2.3(b), subject to the limit on total compensation stated below. For purposes of this subsection (n), the Effective Offer

Price shall be the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day divided by the megawatt hours of energy offered during the Specified Hours, plus the offer for energy during such hours. The Specified Hours shall be the lesser of: (1) the minimum run hours stated by the Market Seller in its Offer Data; and (2) either (i) for steam-electric generating units and for combined-cycle units when such units are operating in combined-cycle mode, the six consecutive hours of highest Day-ahead Price during such Operating Day when such units are running or (ii) for combustion turbine units and for combined-cycle units when such units are operating in combustion turbine mode, the two consecutive hours of highest Day-ahead Price during such Operating Day when such units are running. Notwithstanding any other provision in this subsection, the total compensation to a Market Seller on any Operating Day that includes a MaxGen Condition shall not exceed \$1,000/MWh during the Specified Hours, where such total compensation in each such hour is defined as the amount that, absent subsections (l) and (n), would have been credited for Operating Reserves for such Operating Day pursuant to Section 3.2.3(b) divided by the Specified Hours, plus the Day-ahead Price for such hour, and no Operating Reserves payments shall be made for any other hour of such Operating Day. If a unit operates in real time at the direction of the office of the Interconnection consistently with its day-ahead clearing, then subsection (m) does not apply.

(o) Dispatchable pool-scheduled generation resources and dispatchable self-scheduled generation resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Pool-scheduled generation resources and dispatchable self-scheduled generation resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations in accordance with the calculations described in the PJM Manuals. Ramp-limited desired MW values shall be used to determine generation resource real-time deviations from the resource's day-ahead schedules.

The Office of the Interconnection shall calculate a ramp-limited desired MW value for generation resources where the economic minimum and economic maximum are at least as far apart in real-time as they are in day-ahead according to the following parameters:

- (i) real-time economic minimum $\leq$ 105% of day-ahead economic minimum or day-ahead economic minimum plus 5 MW, whichever is greater.
- (ii) real-time economic maximum $\geq$ 95% day-ahead economic maximum or day-ahead economic maximum minus 5 MW, whichever is lower.

The ramp-limited desired MW value for a generation resource shall be equal to:

$$\text{Ramp\_Request}_t = \frac{(\text{UDS}_{\text{target}}_{t-1} - \text{AOutput}_{t-1})}{(\text{UDSLA}_{\text{time}}_{t-1})}$$

$$\text{RL\_Desired}_t = \text{AOutput}_{t-1} + \left(\text{Ramp\_Request}_t * \text{Case\_Eff\_time}_{t-1} \right)$$

where:

1. $\text{UDS}_{\text{target}}$ = UDS basepoint for the previous UDS case

2. AOutput = Unit's output at case solution time
3. UDSLAtime = UDS look ahead time
4. Case_Eff_time = Time between base point changes
5. RL_Desired = Ramp-limited desired MW

To determine if a generation resource is following dispatch the Office of the Interconnection shall determine the unit's MW off dispatch and % off dispatch by using the lesser of the difference between the actual output and the UDS Basepoint or the actual output and ramp-limited desired MW value. The % off dispatch and MW off dispatch will be a time-weighted average over the course of an hour.

A pool-scheduled or dispatchable self-scheduled resource is considered to be following dispatch if its actual output is between its ramp-limited desired MW value and UDS Basepoint, or if its % off dispatch is ≤ 10 , or its hourly integrated Real-time MWh is within 5% or 5 MW (whichever is greater) of the hourly integrated ramp-limited desired MW. A self-scheduled generator must also be dispatched above economic minimum. The degree of deviations for resources that are not following dispatch shall be determined in accordance with the following provisions:

- A dispatchable self-scheduled resource that is not dispatched above economic minimum shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – Day-Ahead MWh.
- A resource that is dispatchable day-ahead but is Fixed Gen in real-time shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – UDS LMP Desired MW.
- Pool-scheduled generators that are not following dispatch shall be assessed balancing Operating Reserve deviations according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW.
- If a resource's real-time economic minimum is greater than its day-ahead economic minimum by 5% or 5 MW, whichever is greater, or its real-time economic maximum is less than its Day Ahead economic maximum by 5% or 5 MW, whichever is lower, and UDS LMP Desired MWh for the hour is either below the real time economic minimum or above the real time economic maximum, then balancing Operating Reserve deviations for the resource shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch and its % Off Dispatch is $\leq 20\%$, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh – hourly integrated Ramp-Limited Desired MW. If deviation value is within 5% or 5 MW (whichever is greater) of Ramp-Limited Desired MW, balancing Operating Reserve deviations shall not be assessed.

- If a resource is not following dispatch and its % off Dispatch is > 20%, balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – UDS LMP Desired MWh.
- If a resource is not following dispatch, and the resource has tripped, for the hour the resource tripped and the hours it remains offline throughout its day-ahead schedule balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real time MWh – Day-Ahead MWh.
- For resources that are not dispatchable in both the Day-Ahead and Real-time Energy Markets balancing Operating Reserve deviations shall be assessed according to the following formula: hourly integrated Real-time MWh and Day-Ahead MWh.

(o-1) Dispatchable economic load reduction resources that follow dispatch shall not be assessed balancing Operating Reserve deviations. Economic load reduction resources that do not follow dispatch shall be assessed balancing Operating Reserve deviations as described in this subsection and as further specified in the PJM Manuals.

The Desired MW quantity for such resources for each hour shall be the hourly integrated MW quantity to which the load reduction resource was dispatched for each hour (where the hourly integrated value is the average of the dispatched values as determined by the Office of the Interconnection for the resource for each hour).

If the actual reduction quantity for the load reduction resource for a given hour deviates by no more than 20% above or below the Desired MW quantity, then no balancing Operating Reserve deviation will accrue for that hour. If the actual reduction quantity for the load reduction resource for a given hour is outside the 20% bandwidth, the balancing Operating Reserve deviations will accrue for that hour in the amount of the absolute value of (Desired MW – actual reduction quantity). For those hours where the actual reduction quantity is within the 20% bandwidth specified above, the load reduction resource will be eligible to be made whole for the total value of its offer as defined in section 3.3A of this Appendix. Hours for which the actual reduction quantity is outside the 20% bandwidth will not be eligible for the make-whole payment. If at least one hour is not eligible for make-whole payment based on the 20% criteria, then the resource will also not be made whole for its shutdown cost.

(p) The Office of the Interconnection shall allocate the charges assessed pursuant to Section 3.2.3(h) of Schedule 1 of this Agreement to real-time deviations from day-ahead schedules or real-time load share plus exports depending on whether the underlying balancing Operating Reserve credits are related to resources scheduled during the reliability analysis for an Operating Day, or during the actual Operating Day.

- (i) For resources scheduled by the Office of the Interconnection during the reliability analysis for an Operating Day, the associated balancing Operating Reserve charges shall be allocated based on the reason the resource was scheduled according to the following provisions:

(A) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to operate in real-time to augment the physical resources committed in the Day-ahead Energy Market to meet the forecasted real-time load plus the Operating Reserve requirement, the associated balancing Operating Reserve charges shall be allocated to real-time deviations from day-ahead schedules.

(B) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource was committed to maintain system reliability, the associated balancing Operating Reserve charges shall be allocated according to ratio share of real time load plus export transactions.

(C) If the Office of the Interconnection determines during the reliability analysis for an Operating Day that a resource with a day-ahead schedule is required to deviate from that schedule to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated pursuant to (A) or (B) above.

(ii) For resources scheduled during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to the following provisions:

(A) If the Office of the Interconnection directs a resource to operate during an Operating Day to provide balancing Operating Reserves, the associated balancing Operating Reserve charges shall be allocated according to ratio share of load plus exports. The foregoing notwithstanding, charges will be assessed pursuant to this section only if the LMP at the resource's bus does not meet or exceed the applicable offer of the resource for at least four 5-minute intervals during one or more discrete clock hours during each period the resource operated and produced MWs during the relevant Operating Day. If a resource operated and produced MWs for less than four 5-minute intervals during one or more discrete clock hours during the relevant Operating Day, the charges for that resource during the hour it was operated less than four 5-minute intervals will be identified as being in the same category as identified for the Operating Reserves for the other discrete clock hours.

(B) If the Office of the Interconnection directs a resource not covered by Section 3.2.3(h)(ii)(A) of Schedule 1 of this Agreement to operate in real-time during an Operating Day, the associated balancing Operating Reserve charges shall be allocated according to real-time deviations from day-ahead schedules.

(q) The Office of the Interconnection shall determine regional balancing Operating Reserve rates for the Western and Eastern Regions of the PJM Region. For the purposes of this section, the Western Region shall be the AEP, APS, ComEd, Duquesne, Dayton ATSI transmission Zones, and the Eastern Region shall be the AEC, BGE, Dominion, PENELEC, PEPCO, ME, PPL, JCPL, PECO, DPL, PSEG, RE transmission Zones. The regional balancing Operating Reserve rates shall be determined in accordance with the following provisions:

(i) The Office of the Interconnection shall calculate regional adder rates for the Eastern and Western Regions. Regional adder rates shall be equal to the total balancing Operating Reserve credits paid to generators for transmission constraints that occur on transmission system capacity equal to or less than 345kv. The regional adder rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are designated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(ii) The Office of the Interconnection shall calculate RTO balancing Operating Reserve rates. RTO balancing Operating Reserve rates shall be equal to balancing Operating Reserve credits in excess of the regional adder rates calculated pursuant to Section 3.2.3(q)(i) of Schedule 1 of this Agreement. The RTO balancing Operating Reserve rates shall be separated into reliability and deviation charges, which shall be allocated to real-time load or real-time deviations, respectively. Whether the underlying credits are allocated as reliability or deviation charges shall be determined in accordance with Section 3.2.3(p).

(iii) Reliability and deviation regional balancing Operating Reserve rates shall be determined by summing the relevant RTO balancing Operating Reserve rates and regional adder rates.

(iv) If the Eastern and/or Western Regions do not have regional adder rates, the relevant regional balancing Operating Reserve rate shall be the reliability and/or deviation RTO balancing Operating Reserve rate.

3.2.3A Synchronized Reserve.

(a) Each Internal Market Buyer that is a Load Serving Entity shall have an obligation for hourly Synchronized Reserve equal to its pro rata share of Synchronized Reserve requirements for the hour for each Synchronized Reserve Zone of the PJM Region, based on the Market Buyer's total load (net of operating Behind The Meter Generation, but not to be less than zero) in such Synchronized Reserve Zone, for the hour ("Synchronized Reserve Obligation"), less any amount obtained from condensers associated with provision of Reactive Services as described in section 3.2.3B(i) and any amount obtained from condensers associated with post-contingency operations, as described in section 3.2.3C(b). An Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation shall be charged for the Synchronized Reserve dispatched by the Office of the Interconnection to meet such obligation at the Synchronized Reserve Market Clearing Price determined in accordance with subsection (d) of this section, plus the amounts if any, described in subsections (g), (h) and (i) of this section.

(b) A Generating Market Buyer supplying Synchronized Reserve at the direction of the Office of the Interconnection, in excess of its hourly Synchronized Reserve Obligation, shall be credited as follows:

- i) Credits for Synchronized Reserve provided by generation units that are then subject to the energy dispatch signals and instructions of the Office of the Interconnection and that increase their current output or Demand Resources that reduce their load in response to a Synchronized Reserve Event (“Tier 1 Synchronized Reserve”) shall be at the Synchronized Energy Premium Price.
- ii) Credits for Synchronized Reserve provided by generation resources that are synchronized to the grid but, at the direction of the Office of the Interconnection, are operating at a point that deviates from the Office of the Interconnection energy dispatch signals and instructions (“Tier 2 Synchronized Reserve”) shall be the higher of (i) the Synchronized Reserve Market Clearing Price or (ii) the sum of (A) the Synchronized Reserve offer, and (B) the specific opportunity cost of the generation resource supplying the increment of Synchronized Reserve, as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals.
- iii) Credits for Synchronized Reserve provided by Demand Resources that are synchronized to the grid and accept the obligation to reduce load in response to a Synchronized Reserve Event initiated by the Office of the Interconnection shall be the sum of (i) the higher of (A) the synchronized Reserve offer or (B) the Synchronized Reserve Market Clearing Price and (ii) if a Synchronized Reserve Event is actually initiated by the Office of the Interconnection and the Demand Resource reduced its load in response to the event, the fixed costs associated with achieving the load reduction, as specified in the PJM Manuals.

(c) The Synchronized Reserve Energy Premium Price is the average of the five-minute Locational Marginal Prices calculated during the Synchronized Reserve Event plus an adder in an amount to be determined periodically by the Office of the Interconnection not less than fifty dollars and not to exceed one hundred dollars per megawatt hour.

(d) The Synchronized Reserve Market Clearing Price shall be determined for each Synchronized Reserve Zone by the Office of the Interconnection prior to the operating hour and such market-clearing price shall be equal to, from among the generation resources or Demand Resources selected to provide Synchronized Reserve for such Synchronized Reserve Zone, the highest sum of either (i) a generation resource’s Synchronized Reserve offer and opportunity cost or (ii) a demand response resource’s Synchronized Reserve offer.

(e) In determining the Synchronized Reserve Market Clearing Price, the estimated unit-specific opportunity cost for a generation resource shall be equal to the sum of (i) the product of

(A) the expected Locational Marginal Price at the generation bus for the generation resource times (B) the megawatts of energy used to provide Synchronized Reserve submitted as part of the Synchronized Reserve offer and (ii) the product of (A) the deviation of the set point of the generation resource that is expected to be required in order to provide Synchronized Reserve from the generation resource's expected output level if it had been dispatched in economic merit order times (B) the absolute value of the difference between the expected Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(f) In determining the credit under subsection (b) to a Generating Market Buyer selected to provide Tier 2 Synchronized Reserve and that actively follows the Office of the Interconnection's signals and instructions, the unit-specific opportunity cost of a generation resource shall be determined for each hour that the Office of the Interconnection requires a generation resource to provide Tier 2 Synchronized Reserve and shall be equal to the sum of (i) the product of (A) the megawatts of energy used by the resource to provide Synchronized Reserve as submitted as part of the generation resource's Synchronized Reserve offer times (B) the Locational Marginal Price at the generation bus of the generation resource, and (ii) the product of (A) the deviation of the generation resource's output necessary to follow the Office of the Interconnection's signals and instructions from the generation resource's expected output level if it had been dispatched in economic merit order, times (B) the absolute value of the difference between the Locational Marginal Price at the generation bus for the generation resource and the offer price for energy from the generation resource (at the megawatt level of the Synchronized Reserve set point for the generation resource) in the PJM Interchange Energy Market. The opportunity costs for a Demand Resource shall be zero.

(g) Charges for Tier 1 Synchronized Reserve will be allocated in proportion to the amount of Tier 1 Synchronized Reserve applied to each Synchronized Reserve Obligation. In the event Tier 1 Synchronized Reserve is provided by a Market Seller in excess of that Market Seller's Synchronized Reserve Obligation, the remainder of the Tier 1 Synchronized Reserve that is not utilized to fulfill the Seller's obligation will be allocated proportionately among all other Synchronized Reserve Obligations.

(h) Any amounts credited for Tier 2 Synchronized Reserve in an hour in excess of the Synchronized Reserve Market Clearing Price in that hour shall be allocated and charged to each Internal Market Buyer that does not meet its hourly Synchronized Reserve Obligation in proportion to its purchases of Synchronized Reserve in megawatt-hours during that hour.

(i) In the event the Office of the Interconnection needs to assign more Tier 2 Synchronized Reserve during an hour than was estimated as needed at the time the Synchronized Reserve Market Clearing Price was calculated for that hour due to a reduction in available Tier 1 Synchronized Reserve, the costs of the excess Tier 2 Synchronized Reserve shall be allocated and charged to those providers of Tier 1 Synchronized Reserve whose available Tier 1 Synchronized Reserve was reduced from the needed amount estimated during the Synchronized

Reserve Market Clearing Price calculation, in proportion to the amount of the reduction in Tier 1 Synchronized Reserve availability.

(j) In the event a generation resource or Demand Resource that either has been assigned by the Office of the Interconnection or self-scheduled by the owner to provide Tier 2 Synchronized Reserve fails to provide the assigned or self-scheduled amount of Synchronized Reserve in response to an actual Synchronized Reserve Event, the owner of the resource shall incur an additional Synchronized Reserve Obligation in the amount of the shortfall for a period of three consecutive days with the same peak classification (on-peak or off-peak) as the day of the Synchronized Reserve Event at least three business days following the Synchronized Reserve Event. The overall Synchronized Reserve requirement for each Synchronized Reserve Zone of the PJM Region on which the Synchronized Reserve Obligations, except for the additional obligations set forth in this section, are based shall be reduced by the amount of this shortfall for the applicable three-day period.

(k) The magnitude of response to a Synchronized Reserve Event by a generation resource or a Demand Resource, except for Batch Load Demand Resources covered by section 3.2.3A(l), is the difference between the generation resource's output or the Demand Resource's consumption at the start of the event and its output or consumption ten minutes after the start of the event. In order to allow for small fluctuations and possible telemetry delays, generation resource output or Demand Resource consumption at the start of the event is defined as the lowest telemetered generator resource output or greatest Demand Resource consumption between one minute prior to and one minute following the start of the event. Similarly, a generation resource's output or a Demand Resource's consumption 10 minutes after the event is defined as the greatest generator resource output or lowest Demand Resource consumption achieved between 9 and 11 minutes after the start of the event. The response actually credited to a generation resource will be reduced by the amount the megawatt output of the generation resource falls below the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter. The response actually credited to a Demand Resource will be reduced by the amount the megawatt consumption of the Demand Resource exceeds the level achieved after 10 minutes by either the end of the event or after 30 minutes from the start of the event, whichever is shorter.

(l) The magnitude of response by a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the start of a Synchronized Reserve Event shall be the difference between (i) the Batch Load Demand Resource's consumption at the end of the Synchronized Reserve Event and (ii) the Batch Load Demand Resource's consumption during the minute within the ten minutes after the end of the Synchronized Reserve Event in which the Batch Load Demand Resource's consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the magnitude of the response shall be zero if, when the Synchronized Reserve Event commences, the scheduled off-cycle stage of the production cycle is greater than ten minutes.

3.2.3A.01 Day-ahead Scheduling Reserves.

(a) The Office of the Interconnection shall satisfy the Day-ahead Scheduling Reserves Requirement by procuring Day-ahead Scheduling Reserves in the Day-ahead Scheduling Reserves Market from Day-ahead Scheduling Reserves Resources, provided that Demand Resources shall be limited to providing the lesser of any limit established by the Reliability First Corporation or SERC, as applicable, or twenty-five percent of the total Day-ahead Scheduling Reserves Requirement. Day-ahead Scheduling Reserves Resources that clear in the Day-ahead Scheduling Reserves Market shall receive a Day-ahead Scheduling Reserves schedule from the Office of the Interconnection for the relevant Operating Day. PJMSettlement shall be the Counterparty to the purchases and sales of Day-ahead Scheduling Reserves in the PJM Interchange Energy Market; provided that PJMSettlement shall not be a contracting party to bilateral transactions between Market Participants or with respect to a self-schedule or self-supply of generation resources by a Market Buyer to satisfy its Day-ahead Scheduling Reserves Requirement.

(b) A Day-ahead Scheduling Reserves Resource that receives a Day-ahead Scheduling Reserves schedule pursuant to subsection (a) of this section shall be paid the hourly Day-ahead Scheduling Reserves Market clearing price for the MW obligation in each hour of the schedule, subject to meeting the requirements of subsection (c) of this section.

(c) To be eligible for payment pursuant to subsection (b) of this section, Day-ahead Scheduling Reserves Resources shall comply with the following provisions:

- (i) Generation resources with a start time greater than thirty minutes are required to be synchronized and operating at the direction of the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule and shall have a dispatchable range equal to or greater than the Day-ahead Scheduling Reserves schedule.
- (ii) Generation resources and Demand Resources with start times or shut-down times, respectively, equal to or less than 30 minutes are required to respond to dispatch directives from the Office of the Interconnection during the resource's Day-ahead Scheduling Reserves schedule. To meet this requirement the resource shall be required to start or shut down within the specified notification time plus its start or shut down time, provided that such time shall be less than thirty minutes.
- (iii) Demand Resources with a Day-ahead Scheduling Reserves schedule shall be credited based on the difference between the resource's MW consumption at the time the resource is directed by the Office of the Interconnection to reduce its load (starting MW usage) and the resource's MW consumption at the time when the Demand Resource is no longer dispatched by PJM (ending MW usage). For the purposes of this subsection, a resource's starting MW usage shall be the greatest telemetered consumption between one minute prior to and one minute following the issuance of a dispatch instruction from the Office of the Interconnection, and a resource's ending MW usage shall be the lowest

consumption between one minute before and one minute after a dispatch instruction from the Office of the Interconnection that is no longer necessary to reduce.

- (iv) Notwithstanding subsection (iii) above, the credit for a Batch Load Demand Resource that is at the stage in its production cycle when its energy consumption is less than the level of megawatts in its offer at the time the resource is directed by the Office of the Interconnection to reduce its load shall be the difference between (i) the “ending MW usage” (as defined above) and (ii) the Batch Load Demand Resource’s consumption during the minute within the ten minutes after the time of the “ending MW usage” in which the Batch Load Demand Resource’s consumption was highest and for which its consumption in all subsequent minutes within the ten minutes was not less than fifty percent of the consumption in such minute; provided that, the credit shall be zero if, at the time the resource is directed by the Office of the Interconnection to reduce its load, the scheduled off-cycle stage of the production cycle is greater than the timeframe for which the resource was dispatched by PJM.

Resources that do not comply with the provisions of this subsection (c) shall not be eligible to receive credits pursuant to subsection (b) of this section.

(d) The cost of credits allocated to Day-ahead Scheduling Reserves Resources pursuant to this section shall be charged to Load-Serving Entities in the PJM Region based on load ratio share (net of operating Behind The Meter Generation, but not to be less than zero), provided that a Load-Serving Entity may satisfy its Day-ahead Scheduling Reserves obligation, which is equal to the Day-ahead Scheduling Reserves Requirement multiplied by the Load-Serving Entity’s load ratio share for the PJM Region, through one or any combination of the following: 1) the Day-ahead Scheduling Reserves Market; 2) and bilateral arrangements. The Day-ahead Scheduling Reserve charges allocated pursuant to this section shall reflect any portion of a Load-Serving Entity’s Day-ahead Scheduling Reserves obligation that is met by bilateral arrangement(s).

(e) If the Day-ahead Scheduling Reserves Requirement is not satisfied through the operation of subsection (a) of this section, any additional Operating Reserves required to meet the requirement shall be scheduled by the Office of the Interconnection pursuant to Section 3.2.3 of Schedule 1 of this Agreement.

3.2.3B Reactive Services.

(a) A Market Seller providing Reactive Services at the direction of the Office of the Interconnection shall be credited as specified below for the operation of its resource. These provisions are intended to provide payments to generating units when the LMP dispatch algorithms would not result in the dispatch needed for the required reactive service. LMP will be used to compensate generators that are subject to redispatch for reactive transfer limits.

(b) At the end of each Operating Day, where the active energy output of a Market Seller's resource is reduced or suspended at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region, the Market Seller shall be credited according to Sections 3.2.3B(c) & 3.2.3B(d).

(c) A Market Seller providing Reactive Services from either a steam-electric generating unit or combined cycle unit operating in combined cycle mode, where such unit is pool-scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override) shall be compensated for lost opportunity cost by receiving a credit hourly in an amount equal to $\{(LMP_{DMW} - AG) \times (URTLMP - UB)\}$

where:

LMP_{DMW} equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

AG equals the actual hourly integrated output of the unit;

URTLMP equals the real time LMP at the unit's bus;

UB equals the unit offer for that unit for which output is reduced or suspended determined according to the real time scheduled offer curve on which the unit was operating, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UB$ shall not be negative.

(d) A Market Seller providing Reactive Services from either a combustion turbine unit or combined cycle unit operating in simple cycle mode that is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), operated as requested by the Office of the Interconnection, shall be compensated for lost opportunity cost if either of the following conditions occur:

(i) if the unit output is reduced at the direction of the Office of the Interconnection and the real time LMP at the unit's bus is higher than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection as directed by the PJM dispatcher, then the Market Seller shall be credited in a manner consistent with that described above in

Section 3.2.3B(c) for a steam unit or a combined cycle unit operating in combined cycle mode.

(ii) if the unit is scheduled to produce energy in the day-ahead market, but the unit is not called on by PJM and does not operate in real time, then the Market Seller shall be credited hourly in an amount equal to the higher of (i) $\{(URTLMP - UDALMP) \times DAG\}$, or (ii) $\{(URTLMP - UB) \times DAG\}$ where:

URTLMP equals the real time LMP at the unit's bus;

UDALMP equals the day-ahead LMP at the unit's bus;

DAG equals the day-ahead scheduled unit output for the hour;

UB equals the offer price for the unit determined according to the schedule on which the unit was committed day-ahead, unless such schedule was a price-based schedule and the offer associated with that price-based schedule is less than the cost-based offer for the unit, in which case the offer for the unit will be determined based on the cost-based schedule; and

where $URTLMP - UDALMP$ and $URTLMP - UB$ shall not be negative.

(e) At the end of each Operating Day, where the active energy output of a Market Seller's unit is increased at the request of the Office of the Interconnection for the purpose of maintaining reactive reliability within the PJM Region and the offered price of the energy is above the real-time LMP at the unit's bus, the Market Seller shall be credited according to Section 3.2.3B(f).

(f) A Market Seller providing Reactive Services from either a steam-electric generating unit, combined cycle unit or combustion turbine unit, where such unit is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the hourly integrated, real time LMP at the unit's bus is lower than the price offered by the Market Seller for energy from the unit at the level of output requested by the Office of the Interconnection (as indicated either by the desired MWs of output from the unit determined by PJM's unit dispatch system or as directed by the PJM dispatcher through a manual override), shall receive a credit hourly in an amount equal to $\{(AG - LMPDMW) \times (UB - URTLMP)\}$ where:

AG equals the actual hourly integrated output of the unit;

LMPDMW equals the level of output for the unit determined according to the point on the scheduled offer curve on which the unit was operating corresponding to the hourly integrated real time LMP;

UB equals the unit offer for that unit for which output is increased, determined according to the real time scheduled offer curve on which the unit was operating;

URTLMP equals the real time LMP at the unit's bus; and

where UB - URTLMP shall not be negative.

(g) A Market Seller providing Reactive Services from a hydroelectric resource where such resource is pool scheduled (or self-scheduled, if operating according to Section 1.10.3 (c) hereof), and where the output of such resource is altered from the schedule submitted by the Market Seller for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, shall be compensated for lost opportunity cost in the same manner as provided in sections 3.2.2A(d) and 3.2.3A(f) and further detailed in the PJM Manuals.

(h) If a Market Seller believes that, due to specific pre-existing binding commitments to which it is a party, and that properly should be recognized for purposes of this section, the above calculations do not accurately compensate the Market Seller for lost opportunity cost associated with following the Office of the Interconnection's dispatch instructions to reduce or suspend a unit's output for the purpose of maintaining reactive reliability, then the Office of the Interconnection, the Market Monitoring Unit and the individual Market Seller will discuss a mutually acceptable, modified amount of such alternate lost opportunity cost compensation, taking into account the specific circumstances binding on the Market Seller. Following such discussion, if the Office of the Interconnection accepts a modified amount of alternate lost opportunity cost compensation, the Office of Interconnection shall invoice the Market Seller accordingly. If the Market Monitoring Unit disagrees with the modified amount of alternate lost opportunity cost compensation, as accepted by the Office of the Interconnection, it will exercise its powers to inform the Commission staff of its concerns.

(i) The amount of Synchronized Reserve provided by generating units maintaining reactive reliability shall be counted as Synchronized Reserve satisfying the overall PJM Synchronized Reserve requirements. Operators of these generating units shall be notified of such provision, and to the extent a generating unit's operator indicates that the generation unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated to provide Reactive Services also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing for the purpose of maintaining reactive reliability at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generating unit provided synchronous condensing multiplied by the amount of Synchronized reserve provided by the synchronous condenser or (ii) the sum of (A) the generating unit's hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of MW energy usage for providing synchronous condensing multiplied by the real time LMP at the generation unit's bus, (C) the generation unit's startup-cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generation resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated to provide Reactive Services was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generation unit's cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are

located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to subsection (l) below.

(j) A Market Seller's pool scheduled steam-electric generating unit or combined cycle unit operating in combined cycle mode, that is not committed to operate in the Day-ahead Market, but that is directed by the Office of Interconnection to operate solely for the purpose of maintaining reactive reliability, at the request of the Office of the Interconnection, shall be credited in the amount of the unit's offered price for start-up and no-load fees. The unit also shall receive, if applicable, compensation in accordance with Sections 3.2.3B(e)-(f).

(k) The sum of the foregoing credits as specified in Sections 3.2.3B(b)-(j) shall be the cost of Reactive Services for the purpose of maintaining reactive reliability for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched for the purpose of maintaining reactive reliability in such transmission zone.

(l) The cost of Reactive Services for the purpose of maintaining reactive reliability in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

(m) Generating units receiving dispatch instructions from the Office of the Interconnection under the expectation of increased actual or reserve reactive shall inform the Office of the Interconnection dispatcher if the requested reactive capability is not achievable. Should the operator of a unit receiving such instructions realize at any time during which said instruction is effective that the unit is not, or likely would not be able to, provide the requested amount of reactive support, the operator shall as soon as practicable inform the Office of the Interconnection dispatcher of the unit's inability, or expected inability, to provide the required reactive support, so that the associated dispatch instruction may be cancelled. PJM Performance Compliance personnel will audit operations after-the-fact to determine whether a unit that has altered its active power output at the request of the Office of the Interconnection has provided the actual reactive support or the reactive reserve capability requested by the Office of the Interconnection. PJM shall utilize data including, but not limited to, historical reactive performance and stated reactive capability curves in order to make this determination, and may withhold such compensation as described above if reactive support as requested by the Office of the Interconnection was not or could not have been provided.

3.2.3C Synchronous Condensing for Post-Contingency Operation.

(a) Under normal circumstances, PJM operates generation out of merit order to control contingency overloads when the flow on the monitored element for loss of the contingent

element (“contingency flow”) exceeds the long-term emergency rating for that facility, typically a 4-hour or 2-hour rating. At times however, and under certain, specific system conditions, PJM does not operate generation out of merit order for certain contingency overloads until the contingency flow on the monitored element exceeds the 30-minute rating for that facility (“post-contingency operation”). In conjunction with such operation, when the contingency flow on such element exceeds the long-term emergency rating, PJM operates synchronous condensers in the areas affected by such constraints, to the extent they are available, to provide greater certainty that such resources will be capable of producing energy in sufficient time to reduce the flow on the monitored element below the normal rating should such contingency occur.

(b) The amount of Synchronized Reserve provided by synchronous condensers associated with post-contingency operation shall be counted as Synchronized Reserve satisfying the PJM Synchronized Reserve requirements. Operators of these generation units shall be notified of such provision, and to the extent a generation unit’s operator indicates that the generation unit is capable of providing Synchronized Reserve, shall be subject to the same requirements contained in Section 3.2.3A regarding provision of Tier 2 Synchronized Reserve. At the end of each Operating Day, to the extent a condenser operated in conjunction with post-contingency operation also provided Synchronized Reserve, a Market Seller shall be credited for providing synchronous condensing in conjunction with post-contingency operation at the request of the Office of the Interconnection, in an amount equal to the higher of (i) the hourly Synchronized Reserve Market Clearing Price for each hour a generation resource provided synchronous condensing multiplied by the amount of Synchronized Reserve provided by the synchronous condenser or (ii) the sum of (A) the generation resource’s hourly cost to provide synchronous condensing, calculated in accordance with the PJM Manuals, (B) the hourly product of the megawatts of energy used to provide synchronous condensing multiplied by the real-time LMP at the generation bus of the generation resource, (C) the generation resource’s start-up cost of providing synchronous condensing, and (D) the unit-specific lost opportunity cost of the generation resource supplying the increment of Synchronized Reserve as determined by the Office of the Interconnection in accordance with procedures specified in the PJM Manuals. To the extent a condenser operated in association with post-contingency constraint control was not also providing Synchronized Reserve, the Market Seller shall be credited only for the generation unit’s cost to condense, as described in (ii) above. The total Synchronized Reserve Obligations of all Load Serving Entities under section 3.2.3A(a) in the zone where these condensers are located shall be reduced by the amount counted as satisfying the PJM Synchronized Reserve requirements. The Synchronized Reserve Obligation of each Load Serving Entity in the zone under section 3.2.3A(a) shall be reduced to the same extent that the costs of such condensers counted as Synchronized Reserve are allocated to such Load Serving Entity pursuant to subsection (d) below.

(c) The sum of the foregoing credits as specified in section 3.2.3C(b) shall be the cost of synchronous condensers associated with post-contingency operations for the Operating Day and shall be separately determined for each transmission zone in the PJM Region based on whether the resource was dispatched in association with post-contingency operation in such transmission zone.

(d) The cost of synchronous condensers associated with post-contingency operations in a transmission zone in the PJM Region for each Operating Day shall be allocated and charged to each Market Participant in proportion to its deliveries of energy to load (net of operating Behind The Meter Generation) in such transmission zone, served under Network Transmission Service, in megawatt-hours during that Operating Day, as compared to all such deliveries for all Market Participants in such transmission zone.

3.2.4 Transmission Congestion Charges.

Each Market Buyer shall be assessed Transmission Congestion Charges as specified in Section 5 of this Schedule.

3.2.5 Transmission Loss Charges.

Each Market Buyer shall be assessed Transmission Loss Charges as specified in Section 5 of this Schedule.

3.2.6 Emergency Energy.

(a) Market Participants shall be allocated a proportionate share of the net cost of Emergency energy purchased by the Office of the Interconnection. Such allocated share during each hour of such Emergency energy purchase shall be in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales. This deviation shall not include any reduction or suspension of output of pool scheduled resources requested by PJM to manage an Emergency within the PJM Region.

(b) Net revenues in excess of Real-time Prices attributable to sales of energy in connection with Emergencies to other Control Areas shall be credited to Market Participants during each hour of such Emergency energy sale in proportion to the sum of (i) each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Energy Market, whenever that deviation increases the Market Participant's spot market purchases or decreases its spot market sales, and (ii) each Market Participant's energy sales from within the PJM Region to entities outside the PJM Region that have been curtailed by PJM.

(c) The net costs or net revenues associated with sales or purchases of hourly energy in connection with a Minimum Generation Emergency in the PJM Region, or in another Control Area, shall be allocated during each hour of such Emergency sale or purchase to each Market Participant in proportion to the amount of each Market Participant's real-time deviation from its net PJM Interchange in the Day-ahead Market, whenever that deviation increases the Market Participant's spot market sales or decreases its spot market purchases.

3.2.7 Billing.

(a) PJMSettlement shall prepare a billing statement each billing cycle for each Market Buyer in accordance with the charges and credits specified in Sections 3.2.1 through 3.2.6 of this

Schedule, and showing the net amount to be paid or received by the Market Buyer. Billing statements shall provide sufficient detail, as specified in the PJM Manuals, to allow verification of the billing amounts and completion of the Market Buyer's internal accounting.

(b) If deliveries to a Market Buyer that has PJM Interchange meters in accordance with Section 14 of the Operating Agreement include amounts delivered for a Market Participant that does not have PJM Interchange meters separate from those of the metered Market Buyer, PJMSettlement shall prepare a separate billing statement for the unmetered Market Participant based on the allocation of deliveries agreed upon between the Market Buyer and the unmetered Market Participant specified by them to the Office of the Interconnection.

3.3A Economic Load Response Participants.

3.3A.1 Compensation.

Economic Load Response Participants shall be compensated pursuant to Sections 3.3A.4~~5~~ and/or 3.3A.5~~6~~ of this Schedule, for demand reduction offers submitted in the Day-Ahead Energy Market or Real-time Energy Market that satisfy the Net Benefits Test of section 3.3A.4; that are scheduled by the Office of the Interconnection; and that follow the dispatch instructions of the Office of the Interconnection. Qualifying demand reductions shall be measured by: 1) comparing actual metered load to an end-use customer's Customer Baseline Load or alternative CBL determined in accordance with the provisions of Section 3.3A.2 or 3.3A.2.01, respectively; or 2) by the MWs produced by On-Site Generators pursuant to the provisions of Section 3.3A.2.02.

3.3A.2 Customer Baseline Load.

For Economic Load Response Participants that choose to measure demand reductions using an end-use customer's Customer Baseline Load ("CBL"), the CBL shall be determined using the following formula for such participant's Non-Variable Loads:

- (a) The CBL for weekdays shall be the average of the highest 4 out of the 5 most recent ~~highest~~ load weekdays in the 45 calendar day period preceding the relevant load reduction event.
- i. For the purposes of calculating the CBL for weekdays, weekdays shall not include:
 - 1. NERC holidays;
 - 2. Weekend days;
 - 3. Event days. For the purposes of this section an event day shall be any weekday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.4 or 3.3A.5, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;
 - 4. Any weekday where the average daily event period usage is less than 25% of the average event period usage for the five days.
 - ii. ~~For the purposes of calculating the CBL for weekdays, the 45-day period shall be extended one day for each of the following days that occur within the relevant period, provided that extensions pursuant to this section shall not exceed 15 days (i.e. 60 days total including the relevant 45-day period):~~

~~1. NERC holidays;~~

~~2. Event day(s), as defined in subsection (a)(i)(3) above, in which the hourly LMP exceeds the annual threshold in at least 4 hours, where the annual threshold will be effective from June 1 through May 31 and will be determined based on the load weighted average PJM real time LMP for the 99th percentile for the calendar year prior to May 31;~~

~~3. Weekdays the relevant end-use customer site responds to the dispatch instructions of the Office of the Interconnection;~~

~~4. Any weekday the event period usage is less than 25% of the average event period usage for the five days.~~

~~iii.~~ If a 45-day period does not include 5 weekdays that meet the conditions in subsection (a)(i) of this section, provided there are 4 weekdays that meet the conditions in subsection (a)(i) of this section, the CBL shall be based on the average of those 4 weekdays. If there are not 4 eligible weekdays, the CBL shall be determined in accordance with subsection (~~iii~~~~v~~) of this section.

~~iiiv.~~ Section 3.3A.2(a)(i)(3) notwithstanding, if a 45-day period does not include 4 weekdays that meet the conditions in subsection (a)(i) of this section, event days will be used as necessary to meet the 4 day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(b) The CBL for weekend days and NERC holidays shall be determined in accordance with the following provisions:

i. The CBL for Saturdays and Sundays/NERC holidays shall be the average of the highest 2 load days out of the 3 most recent Saturdays or Sundays/NERC holidays, respectively, in the 45 calendar day period preceding the relevant load reduction event, provided that the following days shall not be used to calculate a Saturday or Sunday/NERC holiday CBL:

1. Event days. For the purposes of this section an event day shall be any Saturday and Sunday/NERC holiday that an Economic Load Response Participant submits a settlement pursuant to Section 3.3A.~~45~~ or 3.3A.~~56~~, provided that Event Days shall exclude such days if the settlement is denied by the relevant LSE or electric distribution company or is disallowed by the Office of the Interconnection;

2. Any Saturday or Sunday/NERC holiday where the average daily event period usage is less than 25% of the average event period usage level for the three days;
3. Any Saturday or Sunday/NERC holiday that corresponds to the beginning or end of daylight savings.

ii. ~~For the purposes of calculating the CBL for Saturdays or Sundays/NERC holidays, the 45-day period shall be extended one day for each of the following days that occur within the relevant period, provided that extensions pursuant to this section shall not exceed 15 days (i.e. 60 days total including the relevant 45-day period):~~

~~1. Event day(s), as defined in subsection (b)(i)(1) above, in which the hourly LMP exceeds the annual threshold in at least 4 hours, where the annual threshold will be effective from June 1 through May 31 and will be determined based on the load-weighted average PJM real-time LMP for the 99th percentile for the calendar year prior to May 31;~~

~~2. Saturday or Sundays/NERC holidays where the relevant end-use customer site responds to the dispatch instructions of the Office of the Interconnection.~~

~~iii.~~ If a 45-day period does not include 3 Saturdays or 3 Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, provided there are 2 Saturdays or Sundays/NERC holidays that meet the conditions in subsection (b)(i) of this section, the CBL will be based on the average of those 2 Saturdays or Sundays/NERC holidays. If there are not 2 eligible Saturdays or Sundays/NERC holidays, the CBL shall be determined in accordance with subsection (iiiv) of this section.

~~iiiv.~~ Section 3.3A.2(b)(i)(1) notwithstanding, if a 45-day period does not include 2 Saturdays or Sundays/NERC holidays, respectively, that meet the conditions in subsection (b)(i) of this section, event days will be used as necessary to meet the 2-day requirement to calculate the CBL, provided that any such event days shall be the highest load event days within the relevant 45-day period.

(c) CBLs established pursuant to this section shall represent end-use customers' actual load patterns. If the Office of the Interconnection determines that a CBL or alternative CBL does not accurately represent a customer's actual load patterns, the CBL shall be revised accordingly pursuant to Section 3.3A.2.01. Consistent with this requirement, if an Economic Load Response Participant chooses to measure load reductions using a Customer Baseline Load, the Economic Load Response Participant shall inform the Office of the Interconnection of a change in its operations or the operations of the end-use customer upon whose behalf it is acting

that would result in the adjustment of more than half the hours in the affected party's Customer Baseline Load by twenty percent or more for more than twenty days.

3.3A.2.01 Alternative Customer Baseline Methodologies.

(a) During the Economic Load Response Participant registration process pursuant to Section 1.5A.3 of this Schedule, the relevant Economic Load Response Participant, ~~Load Serving Entity, electric distribution company, and/~~ or the Office of the Interconnection ("Interested Parties") may, in the case of such participant's Non-Variable Load customers, and shall, in the case of its Variable Load customers, propose an alternative CBL calculation that more accurately reflects the relevant end-use customer's consumption pattern relative to the CBL determined pursuant to Section 3.3A.2. In support of such proposal, the participant shall demonstrate that the alternative CBL method shall result in an hourly relative root mean square error of twenty percent or less compared to actual hourly values, as calculated in accordance with the technique specified in the PJM Manuals. Any proposal made pursuant to this section shall be provided to ~~all the~~ other Interested ~~Parties~~Party.

(b) The Interested Parties shall have 30 days to agree on a proposal issued pursuant to subsection (a) of this section. The 30-day period shall start the day the proposal is ~~received~~ provided to the other by all Interested ~~Parties~~Party. If ~~all both~~ Interested Parties agree on a proposal issued pursuant to this section, that alternative CBL calculation methodology shall be effective consistent with the date of the relevant Economic Load Response Participant registration.

(c) If agreement is not reached pursuant to subsection (b) of this section, the Office of the Interconnection shall determine a CBL methodology within 20 days from the expiration of the 30-day period established by subsection (b). A CBL established by the Office of the Interconnection pursuant to this subsection (c) shall be binding upon ~~all both~~ Interested Parties unless the Interested Parties reach agreement on an alternative CBL methodology prior to the expiration of the 20-day period established by this subsection (c).

(d) Operation of this Section 3.3A.2.01 shall not delay Economic Load Response Participant registrations pursuant to Section 1.5A.3, provided that the alternative CBL established pursuant to this section shall be used for all related energy settlements made pursuant to Sections 3.3A.4 and 3.3A.5.

(e) The Office of the Interconnection shall periodically publish alternative CBL methodologies established pursuant to this section in the PJM Manuals.

3.3A.2.02 On-Site Generators.

On-Site Generators used as the basis for Economic Load Response Participant status pursuant to Section 1.5A shall be subject to the following provisions:

- i. The On-Site Generator shall be used sole~~l~~y to enable an Economic Load Response Participant to provide demand reductions in response to the

Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market and shall not otherwise have been operating;

- ii. If subsection (i) does not apply, the amount of energy from an On-Site Generator used to enable an Economic Load Response Participant to provide demand reductions in response to the Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market shall be capable of being quantified in a manner that is acceptable to the Office of the Interconnection.

3.3A.3 ~~Weather Sensitive and~~ Symmetric Additive Adjustment.

(a) ~~Customer Baseline Levels established pursuant to section 3.3A.2 shall be adjusted by the Concurrent with submitting a Economic Load Response Registration Form to the Office of the Interconnection and annually thereafter, the Economic Load Response Participant shall notify the Office of the Interconnection whether it elects to apply the Weather Sensitive Adjustment (or “WSA”) or~~ Symmetric Additive Adjustment ~~for the summer period (May–October) or the winter period (November–April). The Weather Sensitive Adjustment either will decrease or increase Customer Baseline Load values. The Weather Sensitive Adjustment may apply to measure load reductions in both the Real-time Energy Market and Day-ahead Energy Market, except that the simplified analysis for the summer period cannot be used with regard to the Day-ahead Energy Market. Unless an alternative formula is approved by the Office of the Interconnection and agreed upon by all relevant parties, including any Curtailment Service Provider, Load Serving Entity and end-use customer, the Weather Sensitive Adjustment and~~ Symmetric Additive Adjustment shall be calculated using the following ~~applicable~~ formula:

~~Regression Analysis (available for the summer and winter period.)~~

~~Step 1: Perform a regression analysis in Excel using the slope & intercept functions between the end-use customer’s on-peak (8 AM to 8 PM), non-holiday, weekday hourly loads and the temperature-humidity index (“THI”) on a seasonal basis for the period the WSA is being applied.~~

~~The Office of the Interconnection will post on the Office of the Interconnection website a spreadsheet of the THI values for all relevant weather stations located within the PJM region.~~

~~The regression analysis will produce a slope (m), expressed in kW/THI, and an intercept (b), expressed in kW, that describes the sensitivity of the end-use customer’s load to weather.~~

~~Step 2: Determine the average THI for the on-peak hours for the five days used in the weekday CBL calculation.~~

~~Step 3: Determine the average THI for the on-peak hours of the event day.~~

Step 4: Calculate the WSA based on the following formula:

$$WSA = [(m \times \text{THIEVENT DAY}) + b] / [(m \times \text{THICBL DAYS}) + b]$$

Simplified Analysis (available only for the summer period and for the Real-time Energy Market)

Step 1: Determine that the load is weather sensitive by agreement of the end-use customer, the Curtailment Service Provider, and the Load Serving Entity or by the Office of the Interconnection if there is no agreement. Weather adjustments could be negative or positive.

Step 2: Show that the hourly temperature reading at the nearest airport that provides weather information to the Office of the Interconnection equaled or exceeded 85 degrees Fahrenheit during each hour of the reduction event. The hourly temperature reading of another major airport nearby the end-use customer's location may be used if it can be shown that the temperature at the end-use customer's location correlates more closely.

Step 3: Calculate the average hourly load over two full hours beginning three hours prior to the Load Reduction Event.

Step 4: Calculate the average hourly load for the same hours using the values given by the CBL calculation.

Step 5: Compare the resulting average two-hour loads from Steps 3 and 4.

Step 6: Determine if the difference from Step 5 expressed as a percentage is greater than 5 percent. If the difference is greater than 5 percent then the percentage will be the WSA for the reduction event.

Step 7: Submit an Excel spreadsheet to the Office of the Interconnection documenting the weather adjustment.

- The WSA, expressed in percentage terms, shall be applied to each hour of the CBL during the event period in order to establish a weather-adjusted CBL.
- For end-use customers without interval data from the previous summer that select the regression analysis, the WSA shall initially be set at 100 percent. After one month of actual program response, a regression analysis shall be performed and the WSA shall be adjusted in accordance with Steps 1-4 above.
- In no event shall application of the WSA produce a weather-adjusted CBL that exceeds the end-use customer's historical, seasonal, on-peak non-coincident peak load.

~~Symmetric Additive Adjustment~~

Step 1: Calculate the average usage over the 3 hour period ending 1 hour prior to the start of event.

Step 2: Calculate the average usage over the 3 hour period in the CBL that corresponds to the 3 hour period described in Step 1.

Step 3: Subtract the results of Step 2 from the results of Step 1 to determine the symmetric additive adjustment (this may be positive or negative).

Step 4: Add the symmetric additive adjustment (i.e. the results of Step 3) to each hour in the CBL that corresponds to each event hour.

(b) Following a Load Reduction Event that is submitted to the Office of the Interconnection for compensation, the Office of the Interconnection shall provide the Notification window(s), if applicable, directly metered data and Customer Baseline Load and ~~Weather Sensitive Symmetric Additive~~ Adjustment calculations to the appropriate electric distribution company ~~or Load Serving Entity~~ for optional review. The electric distribution company ~~or Load Serving Entity~~ will have ten business days to provide the Office of the Interconnection with notification of any issues related to the metered data or calculations.

3.3A.4 Net Benefits Test.

The Office of the Interconnection shall identify each month the price on a supply curve, representative of conditions expected for that month, at which the benefit of load reductions provided by Economic Load Response Participants exceed the costs of those reductions to other loads. In formulaic terms, the net benefit is deemed to be realized at the price point on the supply curve where $(\Delta \text{LMP} \times \text{MWh consumed}) > (\text{LMP}_{\text{NEW}} \times \text{DR})$, where LMP_{NEW} is the market clearing price after Economic Load Response is dispatched and ΔLMP is the price before Economic Load Response is dispatched minus the LMP_{NEW} .

The Office of the Interconnection shall update and post the Net Benefits Test results and analysis for a calendar month no later than the 15th day of the preceding calendar month. As more fully specified in the PJM Manuals, the Office of the Interconnection shall calculate the net benefit price level in accordance with the following steps:

Step 1. Retrieve generation offers from the same calendar month (of the prior calendar year) for which the calculation is being performed, employing market-based price offers to the extent available, and cost-based offers to the extent market-based price offers are not available. To the extent that generation offers are unavailable from historical data due to the addition of a Zone to the PJM Region the Office of the Interconnection shall use the most recent generation offers that best correspond to the characteristics of the calendar month for which the calculation is being performed, provided that at least 30 days of such data is available. If less than 30 days of data is

available for a resource or group of resources, such resource[s] shall not be considered in the Net Benefits Test calculation.

Step 2: Adjust a portion of each prior-year offer representing the typical share of fuel costs in energy offers in the PJM Region, as specified in the PJM Manuals, for changes in fuel prices based on the ratio of the reference month spot price to the study month forward price. For such purpose, natural gas shall be priced at the Henry Hub price, number 2 fuel oil shall be priced at the New York Harbor price, and coal shall be priced as a blend of coal prices representative of the types of coal typically utilized in the PJM Region.

Step 3. Combine the offers to create daily supply curves for each day in the period.

Step 4. Average the daily curves for each day in the month to form an average supply curve for the study month.

Step 5. Use a non-linear least squares estimation technique to determine an equation that reasonably approximates and smooths the average supply curve.

Step 6. Determine the net benefit level as the point at which the price elasticity of supply is equal to 1 for the estimated supply curve equation established in Step 5.

3.3A.5 Market Settlements in Real-time Energy Market.

(a) Economic Load Response Participants that submit offers for load reductions in the Real time Energy Market no later than 6:00 p.m. on the day prior to the operating day that satisfy the Net Benefits Test and that are dispatched by the Office of the Interconnection participating in the Real-time Energy Market shall be compensated for reducing demand based on the actual kWh relief provided in excess of committed day-ahead load reductions. The offer shall contain the Offer Data specified in section 1.10.1A(k) and shall not thereafter be subject to change; provided, however, the Economic Load Response Participant may revise the previously specified minimum or maximum load reduction quantity for an operating hour by providing notice to the Office of the Interconnection in the form and manner specified in the PJM Manuals no later than three hours prior to such operating hour. Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements. The Economic Load Response Participant that curtails or causes the curtailment of demand in real-time will be compensated by PJMSettlement at the real-time Locational Market Marginal Price less an amount equal to the applicable generation and transmission charges. The applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction.

(b) In cases where the demand reduction is dispatched follows dispatch, as defined in section 3.2.3(o-1), as instructed by the Office of the Interconnection, payment will not be less than the

total value of the demand reduction bid ~~less an amount equal to the applicable generation and transmission charges.~~ For the purposes of this section, the ~~applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction, and the~~ total value of a demand reduction bid shall include any submitted start-up costs associated with reducing demand, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the demand reduction must be committed.

Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, real-time operating reserves. In all cases, the applicable zonal or aggregate (including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) For purposes of load reductions qualifying for compensation hereunder, aAn Economic Load Response Participant shall accumulate credits for energy reductions in those hours when the energy delivered to the end-use customer is less than the end-use customer's Customer Baseline Load at the corresponding hourly rate. In the event the end-use customer's hourly energy consumption is greater than the Customer Baseline Load, the Economic Load Response Participant will accumulate debits at the corresponding hourly rate for the amount that the end-use customer's hourly energy consumption is greater than the Customer Baseline Load. ~~However, in no event will the Economic Load Response Participant credit be reduced below zero on a daily basis. If the actual load reduction, compared to the desired load reduction is outside the deviation levels specified in section 3.2.3(o) of this Appendix, the Economic Load Response Participant shall be assessed balancing operating reserve charges in accordance with that section 3.2.3.~~

(d) ~~Economic Load Response Participants that have Locational Marginal Price based contracts pursuant to which they have agreed to pay their Load Serving Entity for the physical delivery of energy according to the hour value of the real-time Locational Marginal Price as calculated by the Office of the Interconnection, may choose to reduce demand and be compensated for the reduction in the Real-time Energy Market under the following circumstances. The Economic Load Response Participant shall provide the Office of the Interconnection with a strike price for the end-use customer's zonal Locational Marginal Price at which the end-use customer will reduce demand, as well as any start-up costs associated with reducing load, including direct labor and equipment costs and opportunity costs and costs associated with the minimum number of contiguous hours for which the demand reduction must be committed. In cases where the Economic Load Response Participant's zonal Locational Marginal Price reaches the strike price and the demand reduction is dispatched by the Office of the Interconnection, PJM Settlement shall pay such Economic Load Response Participant the difference between the actual savings achieved based on zonal Locational Marginal Price and the total value of the end-use customer's demand reduction bid. For purposes of this provision the total value of the demand reduction bid will be the sum of the strike price times the MW of reduction achieved during each hour of the time period the demand reduction was dispatched by the Office of the Interconnection or the minimum down-time whichever is greater, plus the submitted start-up costs. Demand reductions hereunder will not be eligible to set real-time Locational Marginal Price. The cost of payments to Economic Load Response Participants under~~

this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on ratio-share basis based on their real-time loads in each Zone for which the load-weighted average Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, with the ratio shares determined as follows:

The ratio share for LSE i in zone z shall be $RTL_{iz}/(RTL + X)$ and the ratio share for party j shall be $X_j/(RTL + X)$.

Where:

RTL is the total real time load in all zones where $LMP > \text{Net Benefits Test price}$;

RTL_{iz} is the real-time load for LSE i in zone z ;

X is the total export quantity from PJM in that hour; and

X_j is the export quantity by party j from PJM.

3.3A.56 Market Settlements in the Day-ahead Energy Market.

(a) Economic Load Response Participants dispatched as a result of a qualifying demand reduction offer~~participating~~ in the Day-ahead Energy Market shall be compensated for reducing demand based on the reductions of kWh committed in the Day-ahead Energy Market. An Economic Load Response Participant that submits a demand reduction bid day ahead that satisfies the Net Benefits Test and is accepted by the Office of the Interconnection shall be paid the day-ahead Locational Marginal Price ~~less an amount equal to the applicable generation and transmission charges. The applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction.~~ Economic Load Response Participants may, at their option, combine separately registered loads that have a common pricing point into a single portfolio for purposes of offering and dispatching their load reduction capability; provided however that any load reductions will continue to be measured and verified at the individual registration level prior to aggregation at the portfolio level for purposes of energy market and balancing operating reserves settlements.

(b) Total payments to Economic Load Response Participants for accepted day-ahead demand reduction bids that follow the dispatch instructions of the Office of the Interconnection will not be less than the total value of the demand reduction bid ~~less an amount equal to the applicable generation and transmission charges.~~ For the purposes of this section, ~~the applicable generation and transmission charges are the charges the participant would have otherwise paid the Load Serving Entity absent the demand reduction, and~~ the total value of a demand reduction bid shall include any submitted start-up costs associated with reducing load, including direct labor and equipment costs and opportunity costs and any costs associated with a minimum number of contiguous hours for which the load reduction must be committed. Any shortfall between the applicable Locational Marginal Price and total value of the demand reduction bid will be made up through normal, day-ahead operating reserves. In all cases, the applicable zonal or aggregate

(including nodal) Locational Marginal Price is used as appropriate for the individual end-use customer.

(c) Economic Load Response Participants that have demand reductions committed in the Day-ahead Energy Market that deviate from the day-ahead schedule in real time shall be charged or credited for such variance at the real time LMP plus or minus an amount equal to the applicable balancing operating reserve charge in accordance with section 3.2.3 of this Appendix. Load Serving Entities that otherwise would have load that was reduced shall receive any associated operating reserve credit ~~plus, if the real-time Locational Marginal Price is higher than the day-ahead Locational Marginal Price during the shortfall, the difference between the day-ahead and the real-time Locational Marginal Price times the shortfall.~~

~~(d) Economic Load Response Participants that have real-time Locational Marginal Price-based contracts may not participate in the Day-ahead Energy Market. The cost of payments to Economic Load Response Participants under this section (excluding any portion of the payments recovered as operating reserves pursuant to subsection (b) of this section) for load reductions in any Zone for any hour shall be recovered from Market Participants on a ratio-share basis based on their real-time exports from the PJM Region and from Load Serving Entities on a ratio-share basis based on their real-time loads in each Zone for which the load-weighted average real-time Locational Marginal Price for the hour during which such load reduction occurred is greater than the price determined under the Net Benefits Test for that month, in accordance with the formula prescribed in section 3.3A.5(d).~~

3.3A.67 Prohibited Economic Load Response Participant Market Settlements.

(a) Settlements pursuant to Sections 3.3A.45 and 3.3A.56 shall be limited to demand reductions executed in response to the Locational Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market that satisfy the Net Benefits Test and are dispatched by the Office of the Interconnection.

(b) Demand reductions that do not meet the requirements of Section 3.3A.67(a) shall not be eligible for settlement pursuant to Sections 3.3A.45 and 3.3A.56. Examples of settlements prohibited pursuant to this Section 3.3A.67(b) include, but are not limited to, the following:

- i. Settlements based on variable demand where the timing of the demand reduction supporting the settlement did not change in direct response to Locational Marginal Prices in the Real-time Energy Market and/or the Day-ahead Energy Market;
- ii. Consecutive daily settlements that are the result of a change in normal demand patterns that are submitted to maintain a CBL that no longer reflects the relevant end-use customer's demand;
- iii. Settlements based on On-Site Generator data if the On Site Generation is not supporting demand reductions executed in response to the Locational

Marginal Price in the Real-time Energy Market and/or the Day-ahead Energy Market;

- iv. Settlements based on demand reductions that are the result of operational changes between multiple end-use customer sites in the PJM footprint; ~~provided that, the foregoing notwithstanding, settlements based on such demand reduction shall be allowed if the demand reduction alleviates congestion~~
- v. Settlements that do not include all hours that the Office of the Interconnection dispatched the load reduction, or for which the load reduction cleared in the Day-ahead Market.

(c) The Office of the Interconnection shall disallow settlements for demand reductions that do not meet the requirements of Section 3.3A.67(a). If the Economic Load Response Participant continues to submit settlements for demand reductions that do not meet the requirements of Section 3.3A.67(a), then the Office of the Interconnection shall suspend the Economic Load Response Participant's PJM Interchange Energy Market activity and refer the matter to the FERC Office of Enforcement.

3.3A.78 Economic Load Response Participant Review Process.

(a) The Office of the Interconnection shall review the participation of an Economic Load Response Participant in the PJM Interchange Energy Market under the following circumstances:

- i. An Economic Load Response Participant's registrations submitted pursuant to Section 1.5A.3 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).
- ii. An Economic Load Response Participant's settlements pursuant to 3.3A.45 and 3.3A.56 are disputed more than 10% of the time by any relevant electric distribution company(ies) or Load Serving Entity(ies).
- iii. An Economic Load Response Participant's settlements pursuant to Sections 3.3A.45 and 3.3A.56 are denied by the Office of the Interconnection more than 10% of the time.
- iv. An Economic Load Response Participant's registration will be reviewed when settlements are frequently submitted or if its actual loads frequently deviate from the previously scheduled quantities (as determined for purposes of assessing balancing operating reserves charges). PJM will notify the Participant when their registration is under review. While the Participant's registration is under review by PJM, the Participant may continue economic load reductions but all settlements will be denied by PJM until the registration review is resolved pursuant to subsection (i) or (ii) below. PJM will require the Participant to provide information within

30 days to support that the settlements were submitted for load reduction activity done in response to price and not submitted based on the End-Use Customer's normal operations.

- i) If the Participant is unable to provide adequate supporting information to substantiate the load reductions submitted for settlement, PJM will terminate the registration and may refer the Participant to either the Market Monitoring Unit or the Federal Energy Regulatory Commission for further investigation.
- ii) If the Participant does provide adequate supporting information, the settlements denied by PJM will be resubmitted by the Participant for review according to existing PJM market rules. Further, PJM may introduce an alternative Customer Baseline Load if the existing Customer Baseline Load does not adequately reflect what the customer load would have been absent a load reduction.

~~v. An Economic Load Response Participant's daily settlement will be denied by PJM based on the following criteria:~~

- ~~1) Submission of settlement for self-schedule energy in the Real-time Energy Market where only some of the self-scheduled hours have been included in the daily settlement submission; or~~
- ~~2) Daily settlement with an estimated value less than Five U.S. Dollars (\$5.00); or~~
- ~~3) Daily settlement has a significant number of uneconomic hours where the Locational Marginal Price is less than or equal to the generation plus the transmission portion of an end-use customer's retail rate or price.~~

vi. The electric distribution company ~~and the Load Serving Entity~~ may only deny settlements during the normal settlement review process for inaccurate data including, but not limited to: meter data, line loss factor, Customer Baseline Load calculation, ~~retail rate~~, interval meter owner and a known recurring End-Use Customer outage or holiday.

(b) The Office of the Interconnection shall have thirty days to conduct a review pursuant to this Section 3.3A.78. The Office of the Interconnection may refer the matter to the PJM MMU and/or the FERC Office of Enforcement if the review indicates the relevant Economic Load Response Participant and/or relevant electric distribution company or LSE is engaging in activity that is inconsistent with the PJM Interchange Energy Market rules governing Economic Load Response Participants.