

Price Responsive Demand: Integration into PJM Capacity Market

Continued Discussion

****Revised****

MIC – Item 8
April 13, 2010

- Submittal Requirements of PRD Plan
 - Documentation of Time Varying Retail Rates
- Testing Requirements for PRD
- Examples of how PRD impacts the Clearing of RPM Auctions
 - Base Residual Auction
 - Incremental Auctions
- Impact to the Short Term Resource Target
 - Proposed Treatments for Consideration

Items for Next Discussion

- Examples of PJM/EDCs/LSEs track PLC values & submit Addbacks
- Timeline for submitting PRD Plans

- Development and Review of PRD Plan
 - Submittal Timeline
- Required Key Elements of the PRD Plan
 - PRD Curves (aka Price-Consumption Curves)
 - Indicating relationship between price and demand
 - Estimate of Peak Load during Delivery Year
 - Maximum Emergency Service Level
 - By Substation Location
- Required Supporting Detail
 - Retail Rate Structure
 - Project plan for equipment development

Comment: What is the Documentation of Required Supporting Detail in PRD Plan.

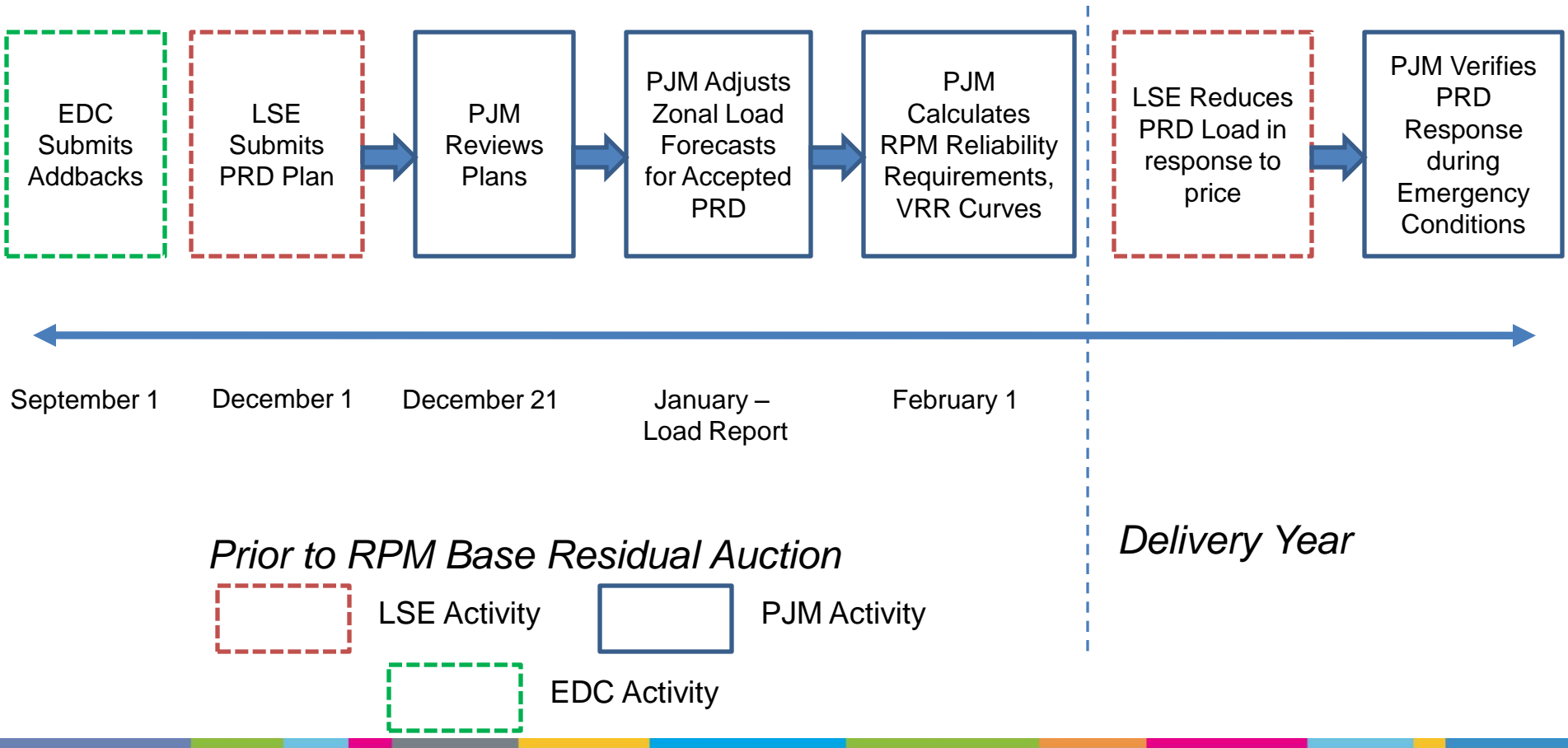
- **Suggested Addition to Business Rules**

4. “Specifications of the equipment used to meet the advanced metering and supervisory control requirements, including a project plan and timeline with the milestones that demonstrates that the AMI and supervisory control will be available and operational for the start of the Delivery Year.
5. Documentation that supports the eligibility of load that will be served under a dynamic retail rate structure during the relevant delivery year, as specified in the Eligibility Section.
6. Any and all updates to required key elements listed above that were submitted in previously accepted PRD Plans.

Comment: What are the Testing Requirements for Price Responsive Demand

- Testing Requirements for PRD will be comparable to testing requirements for Load Management resources, as defined in **Section 8 of PJM Manual 18: PJM Capacity Markets**.
- Testing is required to ensure that the committed load LSE has the ability to achieve the committed Maximum Emergency Service Level (MESL) via either:
 - Respond to the Real-time LMP signal; or
 - Reducing load in response to a supervisory control signal
- Tests may be executed for all resources in a given transmission zone.
- Testing is required to demonstrate compliance for a one hour period

How is PRD incorporated in Load Forecast, Planning and RPM Clearing Processes?



- **Proposed business rules require PRD to be submitted for BRA**
 - Additional PRD may only be permitted in the Incremental Auction if there is an increase in the Zonal peak load forecast.
- PRD submitted for an Incremental Auction instead of BRA may require PJM to sell capacity procured in BRA in the Incremental Auction
 - PJM selling capacity in the IAs will not reduce the final load charges to a level corresponding to PRD submitted for BRA
 - LSE with PRD submitted for an Incremental Auction instead of BRA will get the full reduction in load obligation and in the corresponding load charges. Other LSEs, however, may incur additional load charges due to procuring excess capacity in BRA

Comment: How does PRD impact the Short Term Resource Procurement Target (STRPT)?

Two Possible Options for Consideration:

- a) PRD is subtracted from the Preliminary Zonal Peak Load Forecast
- b) PRD is subtracted from the Short Term Resource Procurement Target

Option (a)

PRD is subtracted from the Preliminary Zonal Peak Load Forecast

Steps

1. LSEs submit PRD for registration by December 1
2. PRD quantity is subtracted from Preliminary Zonal Peak Load Forecast
3. The adjusted Preliminary Zonal Peak Load Forecast is used to calculate Reliability Requirement
4. Short Term Resource Procurement Target is calculated for RTO and allocated to Zones based on the adjusted Preliminary Zonal Peak Load Forecast values (STRPT slightly reduced)
5. Short Term Resource Procurement Target is subtracted from each point on VRR curve

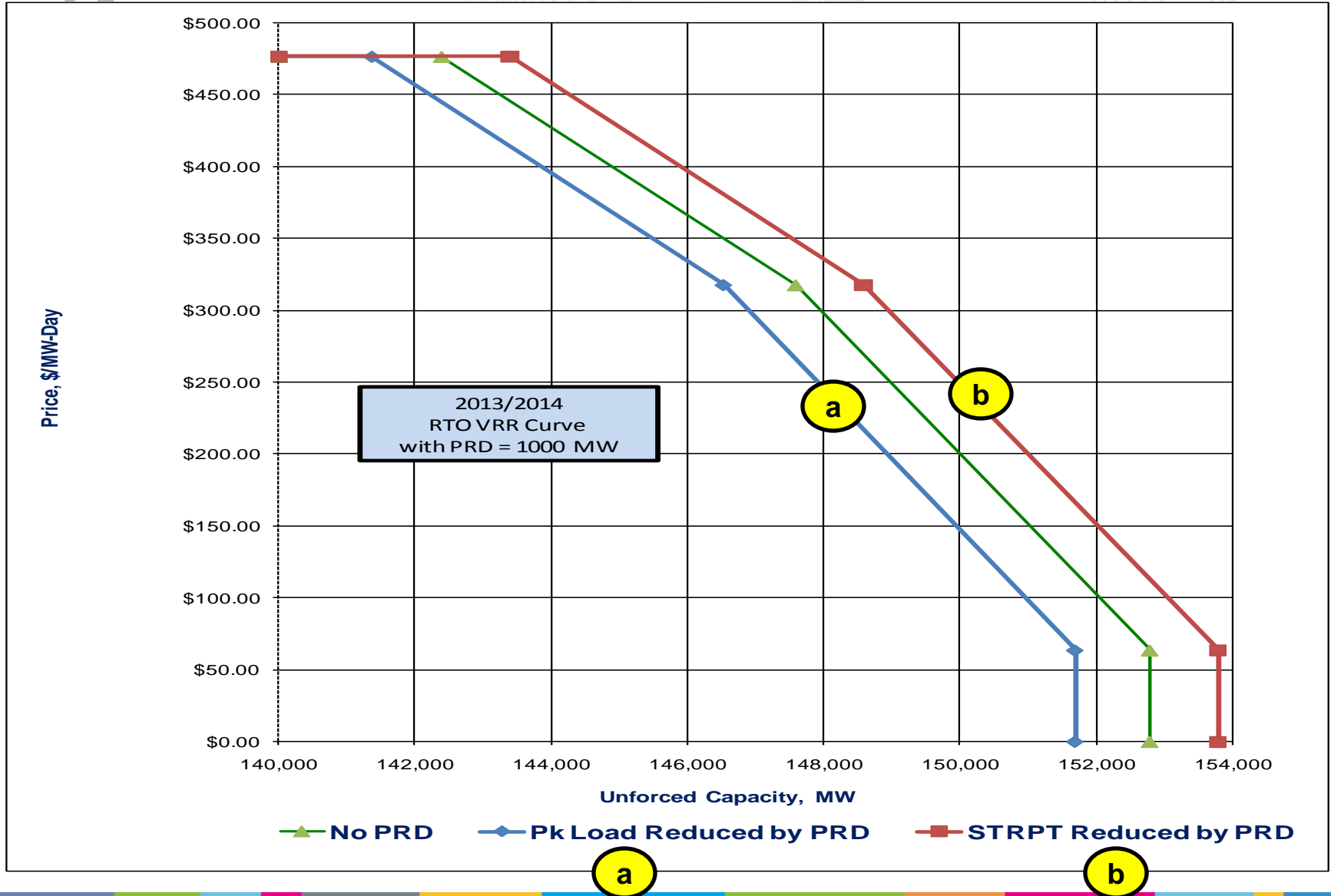
Option (b)

PRD is subtracted from the Short-Term Resource Procurement Target

Steps

1. LSEs submit PRD for registration by December 1
2. Short Term Resource Procurement Target is calculated for RTO and allocated to Zones based on the Preliminary Zonal Peak Load Forecast values
3. UCAP Obligation associated with PRD is subtracted from the Short Term Resource Procurement Target values
4. The adjusted Short Term Resource Procurement Target is subtracted from each point on VRR curve

Example: Options to Treat PRD & STRPT in VRR Curve



Price Responsive Demand Additional Option

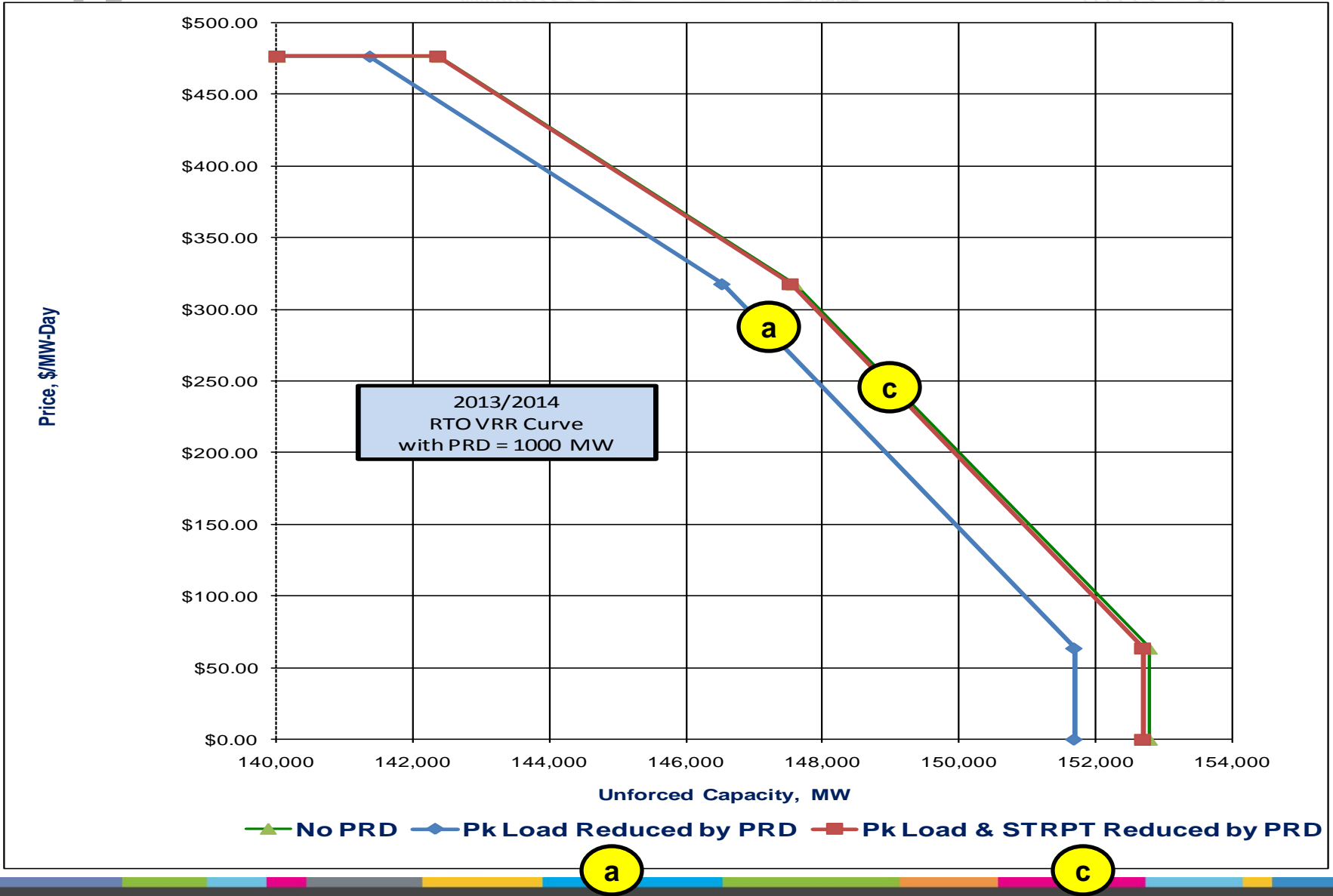
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Option (c)

PRD is subtracted from Zonal Peak Load Forecast and the Short-Term Resource Procurement Target

Steps

1. LSEs submit PRD for registration by December 1
2. PRD quantity is subtracted from Preliminary Zonal Peak Load Forecast
3. The adjusted Preliminary Zonal Peak Load Forecast is used to calculate Reliability Requirement
4. Short Term Resource Procurement Target is calculated for RTO and allocated to Zones based on the adjusted Preliminary Zonal Peak Load Forecast values
5. PRD quantity is subtracted from the Short Term Resource Procurement Target values
6. The adjusted Short Term Resource Procurement Target is subtracted from each point on VRR curve



a

c

BRA RTO VRR Curve 2013/14		Option A	OptionB	Option C
	No PRD	Peak Load Reduced by PRD	STRPT Reduced by PRD	STRPT Reduced by PRD
IRM	15.30%	15.30%	15.30%	15.30%
Pool-wide Avg EFORD	6.30%	6.30%	6.30%	6.30%
FPR	1.0804	1.0804	1.0804	1.0804
DR Factor	0.957	0.957	0.957	0.957
Pk Load Forecast	160,685.0	160,685.0	160,685.0	160,685.0
Nominal PRD Value	0.0	1,000.0	1,000.0	1,000.0
Pk Load Forecast - PRD	160,685.0	159,685.0	160,685.0	159,685.0
Load Forecast * FPR	173,604.1	172,523.7	173,604.1	172,523.7
FRR Obligations	23,563.2	23,563.2	23,563.2	23,563.2
RTO Rel Req	150,040.9	148,960.5	150,040.9	148,960.5
STRPT = 2.5%*Rel Req	3751.0	3724.0	3751.0	3724.0
STRPT, reduced by PRD	3751.0	3724.0	2751.0	2724.0
$(100\%+IRM - 3\%)/(100\%+IRM)$	0.973981	0.973981	0.973981	0.973981
$(100\%+IRM + 1\%)/(100\%+IRM)$	1.008673	1.008673	1.008673	1.008673
$(100\%+IRM + 5\%)/(100\%+IRM)$	1.043365	1.043365	1.043365	1.043365
Point a0 UCAP Level	140,000.0	140,000.0	140,000.0	140,000.0
Point a UCAP Level	142,386.0	141,360.7	143,386.0	142,360.7
Point b UCAP Level	147,591.2	146,528.4	148,591.2	147,528.4
Point c UCAP Level	152,796.4	151,696.2	153,796.4	152,696.2
Point c0 UCAP Level	152,796.4	151,696.2	153,796.4	152,696.2
Point a0 UCAP Price	\$476.93	\$476.93	\$476.93	\$476.93
Point a UCAP Price	\$476.93	\$476.93	\$476.93	\$476.93
Point b UCAP Price	\$317.95	\$317.95	\$317.95	\$317.95
Point c UCAP Price	\$63.59	\$63.59	\$63.59	\$63.59
Zero Price	\$0.00	\$0.00	\$0.00	\$0.00

- **Feedback from Participants**
 - Session for a “page-turn” of Business Rules at end of April, 2010.
FAQ document will be provided
- **Implementation Details to be Finalized**
 - Impact to the Short Term Resource Procurement Target
 - Testing Requirements for PRD
 - Timeline for submitting PRD plans
 - Examples of PJM/EDCs/LSEs track PLC values & submit Addbacks
- **Meetings/Discussions with EDCs & LSEs**
- **Next Steps to integrate in Other areas of PJM Markets**

Dates	Meeting	Milestone
April 28, 2010	MIC Info	“Page Turn” of Business Rules and FAQs
May 19th, 2010	MIC	Continued Discussion of Open Items
June 16th, 2010	MIC	MIC Vote on Business Rules
June 23th, 2010	MRC	MIC Introduction of Business Rules and Agreement Language
August 4th, 2010	MRC	MRC Vote of Agreement Language
August 5th, 2010	TAC	Review of Agreement Language
August 12th, 2010	MC	MC Vote of Agreement Language
September 1, 2010		Target FERC Filing
December 1, 2010		Deadline to submit PRD Plans for 2014/15 BRA