Tariff Attachment K-Appendix and parallel provision of Operating Agreement, Schedule 1

3.2.3 new subsection (s)

(s) Gas Contingency Cost Recovery

(i) The following conditions or events may impact natural gas transportation infrastructure utilized by Market Sellers in the PJM Region in a manner that affects the availability of certain resources needed by the Office of the Interconnection to maintain reliability.

A. Credible and specific cyber/physical threats identifying particular natural gas transportation infrastructure;
B. Failure, degradation, or removal from service of natural gas transportation infrastructure components causing loss or degradation of transport functionality;
C. Force majeure events affecting natural gas transportation infrastructure.

(ii) When such conditions or events impact natural gas transportation infrastructure in the PJM Region in a manner that, absent remediation, would require the Office of the Interconnection to direct a Manual Load Dump Action in order to maintain reliability, the Office of the Interconnection may, after coordination with the applicable natural gas pipeline, local distribution company ("LDC"), and/or Market Seller in accordance with the gas infrastructure contingency analysis provisions of the PJM Manuals, issue an Operating Instruction, as defined by NERC, directing a Market Seller that is the Generation Owner of a resource connected to the impacted natural gas transportation infrastructure to use either: (i) an alternative fuel type (e.g. oil in place of natural gas); or (ii) an alternative fuel source (e.g. an alternative natural gas pipeline).

(iii) A Market Seller that, in response to an Operating Instruction from the Office of the Interconnection, transitions to either: (i) an alternative fuel type; or (ii) an alternative fuel source, may incur certain costs that would not have been incurred but for the Market Seller's response to the Operating Instruction ("Gas Contingency Switching Costs"). Such a Market Seller shall be entitled to file with the Commission under section 205 of the Federal Power Act for recovery of Gas Contingency Switching Costs, within 120 days of the termination of the predicating Operating Instruction from the Office of the Interconnection.

(iv) Costs incurred as a result of Market Seller actions that are unauthorized by an applicable natural gas pipeline or LDC shall not be recoverable as Gas Contingency Switching Costs pursuant to the terms of this subsection. What constitutes an "unauthorized" action is specified in each natural gas pipeline's or LDC's applicable tariff, rate schedule, or customer contract. Such unauthorized actions may include, but are not limited to, the following:

A. consumption of natural gas in direct violation of the terms of an Operational Flow Order ("OFO") or critical notice issued by the relevant natural gas pipeline or LDC;

B. violation of instructions issued by the relevant natural gas pipeline or LDC restricting consumption of natural gas or use of natural gas imbalance service, when such instructions are issued consistent with the pipeline's or LDC's authority under a tariff, rate schedule, or contract;

C. consumption of natural gas during a period of authorized interruption of service by the relevant natural gas pipeline or LDC, determined in accordance with the terms of the applicable tariff, rate schedule, or contract; or

D. use of natural gas balancing services that are explicitly identified in the relevant natural gas pipeline's or LDC's applicable tariff, rate schedule, or contract as unauthorized use or penalty gas.

(v) If and to the extent that a Market Seller has obtained specific authorization from the relevant natural gas pipeline or LDC to take actions that would otherwise be unauthorized, costs incurred as a result of such actions shall be eligible for cost recovery pursuant to the terms of this subsection. Market Sellers shall make every effort to clearly document any authorization they obtain from the natural gas pipeline or LDC. Such documented authorization may be obtained at any time prior to or following the issuance of an Operating Instruction as contemplated by this subsection, but must be obtained prior to filing with the Commission to recover Gas Contingency Switching Costs.

(vi) Market Sellers have an affirmative duty to mitigate Gas Contingency Switching Costs where possible.

(vii) A Market Seller may seek recovery of Gas Contingency Switching Costs pursuant to the terms of this subsection regardless of whether or not the Market Seller's applicable unit is opted-in or opted-out of intraday offers.

(viii) Gas Contingency Switching Costs will be treated as Balancing Operating Reserves for reliability in accordance with Operating Agreement, Schedule 1, section 3.2.3 and Tariff, Attachment K-Appendix, section 3.2.3. The Market Seller is considered to be following PJM dispatch during fuel type or fuel source switching, when following an Operating Instruction issued pursuant to this subsection and in accordance with the gas infrastructure contingency analysis provisions of the PJM Manuals.

(ix) The following existing market settlement procedures will be adjusted or clarified as follows:

A. A Market Seller will be subject to the Capacity Performance Non-Performance Charge and any excuses thereto specified in Tariff, Attachment DD, section 10A.

B. Lost opportunity cost for amount of output reduced from scheduled associated with switching will be treated in a similar manner as flexible resources as defined in 3.2.3 (f-1).

C. A Market Seller is exempt from Deviation charges beginning with the initiation of the Operating Instruction until it follows PJM dispatch in accordance with Tariff, Attachment K-Appendix, Section 3.2.3 (o) and the parallel provision of Operating Agreement, Schedule 1, section 3.2.3(o). This period may extend multiple days if the Operating Instruction lasts multiple electric or gas days.

Tariff, Attachment DD, section 10A(d)

DD 10A - (d) Notwithstanding subsection (c) above, a Capacity Resource or Locational UCAP of a Capacity Market Seller or Locational UCAP Seller shall not be considered in the calculation of a Performance Shortfall for a Performance Assessment Hour to the extent such Capacity Notwithstanding subsection (c) above, a Capacity Resource or Locational UCAP of a Capacity Market Seller or Locational UCAP Seller shall not be considered in the calculation of a Performance Shortfall for a Performance Assessment Interval to the extent such Capacity Resource or Locational UCAP was unavailable during such Performance Assessment Interval solely because the resource on which such Capacity Resource or Locational UCAP is based was on a Generator Planned Outage or Generator Maintenance Outage approved by the Office of the Interconnection, or was not scheduled to operate by the Office of the Interconnection, or was online but was scheduled down, by the Office of the Interconnection, based on a determination by the Office of the Interconnection that such scheduling action was appropriate to the security constrained economic dispatch of the PJM Region, or was instructed by the Office of the Interconnection to switch to an alternate fuel type or fuel source, in accordance with Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provision of Operating Agreement, Schedule 1, section 3.2.3(s) until the Capacity Resource or Locational UCAP is following PJM dispatch as defined in Tariff, Attachment K-Appendix, Section 3.2.3 (o) and the parallel provision of Operating Agreement, Schedule 1, section 3.2.3(o). Such a resource shall be considered in the calculation of a Performance Shortfall if it otherwise was needed and would have been scheduled by the Office of the Interconnection to perform, but was not scheduled to operate, or was scheduled down, solely due to: (i) any operating parameter limitations submitted in the resource's offer, or (ii) the seller's submission of a market-based offer higher than its cost-based.

Tariff, Attachment K- Appendix, section 3.2.3 (o) and parallel provision of OA

(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 below and in the PJM Manuals. 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 <= 105% of day-ahead economic minimum or day-ahead economic minimum plus 5 MW, whichever is greater.

(ii) real-time economic maximum >= 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:

$$\text{Ramp\_Request}_t = \left(\text{UDStarget}_{t-1} - \text{AOutput}_{t-1}\right) \Big/ \left(\text{UDSLAtime}_{t-1}\right)$$

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

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

A pool-scheduled or dispatchable self-scheduled resource is considered to be following dispatch when following an Operating Instruction for gas contingencies, as defined in Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provision of Operating Agreement, Schedule 1, section 3.2.3(s), until the resource is following dispatch, as defined below in this section.

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 for each Real-time Settlement Interval. If the UDS Basepoint and the ramp-limited desired MW for the resource are unavailable, the Office of the Interconnection will determine the unit's MW off dispatch and % off dispatch by calculating the lesser of the difference between the actual output and the UDS LMP Desired MW for each Real-time Settlement Interval.

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 Real-time Settlement Interval MWh is within 5% of the Real-time Settlement Interval 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 for each Real-time Settlement Interval in accordance with the following provisions:

Tariff, Attachment K-Appendix section 3.2.3(f-1) and parallel OA provision

(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 or a Market Seller's unit when following an Operating Instruction issued by the Office of the Interconnection to switch to an alternate fuel type or fuel source, in accordance with Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provision of Operating Agreement, Schedule 1, section 3.2.3(s), shall be compensated for lost opportunity cost, and shall be limited to the lesser of the unit's Economic Maximum or the unit's Maximum Facility Output, 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 Energy Market for a Day-ahead Settlement Interval, but the unit is not called on by the Office of the Interconnection and does not operate in the corresponding Real-time Settlement Interval(s), then the Market Seller shall be credited in an amount equal to the higher of:

1) the product of (A) the amount of megawatts committed in the Day-ahead Energy Market for the generating unit, and (B) the Real-time Price at the generation bus for the generating unit, minus the sum of (C) the applicable offer for energy on which the generating unit was committed in the Day-ahead Energy Market, inclusive of no-load costs, plus (D) the start-up cost, divided by the Real-time Settlement Intervals committed for each set of contiguous hours for which the unit was scheduled in Day-ahead Energy Market. This equation is represented as (A*B) - (C+D). The startup cost, (D), shall be excluded from this calculation if the unit operates in real time following the Office of the Interconnection's direction during any portion of the set of contiguous hours for which the unit was scheduled in Day-ahead Energy Market, or

2) the Real-time Price at the unit's bus minus the Day-ahead Price at the unit's bus, multiplied by the number of megawatts committed in the Day-ahead Energy Market for the generating unit.