3.2.3 new subsection (s)

(s) Gas Contingency Cost Recovery

(i) When the Office of the Interconnection receives verified information regarding near-term credible and specific cyber/physical threats that identify particular natural gas transportation infrastructure, and determines that such threats could, if effectuated:

(A) lead to failure, degradation, or removal from service of natural gas transportation infrastructure components, thereby causing loss or degradation of transport functionality; and

(B) impact the availability of certain natural gas-fueled resources of Market Sellers in the PJM Region in a manner that, after the exhaustion of reasonable remedial operational actions in accordance with Good Utility Practice, would result in thermal or voltage violations, exceeding load dump ratings,

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 an alternative fuel type (e.g. oil in place of natural gas) or an alternative fuel source (e.g. an alternative natural gas pipeline). The Office of the Interconnection shall review the conditions or events underlying the Operating Instruction on an ongoing basis to determine the continuing need for such Operating Instruction, shall, if necessary, reconfirm the Operating Instruction each Operating Day, and shall terminate the Operating Instruction when the Office of the Interconnection determines that it is no longer needed.

(ii) The Office of the Interconnection shall not issue an Operating Instruction directing a Market Seller to use either an alternative fuel type or an alternative fuel source if the Market Seller represents to the Office of the Interconnection that compliance with the Operating Instruction cannot be physically implemented, or that compliance with the Operating Instruction would violate specific safety, equipment, regulatory, or statutory requirements relevant to the ability of the Market Seller to operate its resource in compliance with the Operating Instruction, in accordance with NERC Reliability Standards. Such requirements may include, but are not limited to, requirements under the terms of a natural gas pipeline's or LDC's applicable tariff, rate schedule, or customer contract, and environmental requirements related to emissions from a resource.

(iii) A Market Seller that, in response to an Operating Instruction from the Office of the Interconnection, transitions to either an alternative fuel type or an alternative fuel source, may incur certain costs that: (A) would not have been incurred but for the Market Seller's response to

the Operating Instruction; and (B) except as specified in this subsection (s), are not otherwise recoverable under the PJM Tariff or Operating Agreement due to the absence of a Commission-approved recovery mechanism and/or the fact that the incurrence of such costs was not reasonably foreseeable ("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.

(iv) Absent a finding from the Commission to the contrary, 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. absent a waiver from the applicable gas pipeline or LDC, 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 LDC's or pipeline'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, Gas Contingency Switching Costs incurred as a result of such actions shall be eligible for cost recovery pursuant to the terms of this subsection (s). Market Sellers shall, to the extent possible, 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 (s).

(vi) Market Sellers have an affirmative duty to mitigate Gas Contingency Switching Costs for which they seek recovery pursuant to this subsection (s).

(vii) 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 the parallel provisions of Tariff, Attachment K-Appendix, section 3.2.3. Market Sellers are 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.

(viii) To the extent that a Market Seller fails to comply with an Operating Instruction that meets the requirements of this subsection (s), Market Sellers shall be subject to the Capacity Performance Non-Performance Charge and any excuses thereto, as specified in Tariff, Attachment DD, section 10A. Nothing in this subsection (s) alters the Market Seller's Capacity Performance obligations except as specified herein.

(ix) Market Sellers shall be eligible to recover lost opportunity cost, as specified in Operating Agreement, Schedule 1, section 3.2.3(f-1) and the parallel provisions of Tariff, Attachment K-Appendix, section 3.2.3(f-1).

(x) Market Sellers shall be subject to balancing Operating Reserve deviations and any excuses thereto, as specified in Operating Agreement, Schedule 1, section 3.2.3(o) and the parallel provisions of Tariff, Attachment K-Appendix, section 3.2.3(o).

Tariff, Attachment DD, section 10A(d)

(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 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 alternative fuel type or fuel source, in accordance with Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provisions 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 provisions 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:

$$\text{Ramp\_Request}_t = \frac{(\text{UDStarget}_{t-1} - \text{AOutput}_{t-1})}{(\text{UDSLAtime}_{t-1})}$$

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

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 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:

- A dispatchable self-scheduled resource that is not dispatched above economic minimum shall be assessed balancing Operating Reserve deviations according to the following formula: Real-time Settlement Interval 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: Real-time Settlement Interval 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: Real-time Settlement Interval MWh -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 Real-time Settlement Interval 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: Real time Settlement Interval MWh - UDS LMP Desired MWh.

- 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: Real-time Settlement Interval MWh - Ramp-Limited Desired MW. If deviation value is within 5% 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: Real time Settlement Interval MWh - UDS LMP Desired MWh.

- If a resource is not following dispatch, and the resource has tripped, for the Real-time Settlement Interval the resource tripped and the Real-time Settlement Intervals it remains offline throughout its day-ahead schedule balancing Operating Reserve deviations shall be assessed according to the following formula: Real time Settlement Interval 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: Real-time Settlement Interval MWh - Day-Ahead MWh.

If a resource has a sum of the absolute value of generator deviations for an hour that is less than 5 MWh, then the resource shall not be assessed balancing Operating Reserve deviations for that hour.

In addition, a pool-scheduled or dispatchable self-scheduled resource is also considered to be following dispatch when transitioning to an alternative fuel type or fuel source in compliance with an Operating Instruction for gas contingencies, as defined in Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provisions of Operating Agreement, Schedule 1, section 3.2.3(s).

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

(f-1) With the exception of Market Sellers of Flexible Resources that submit a Real-time Offer greater than their resource's Committed Offer in the Day-ahead Energy Market, a Market Seller of a Flexible Resource or a Market Seller's unit when following an Operating Instruction issued by the Office of the Interconnection to switch to an alternative fuel type or fuel source, in accordance with Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provisions 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 Generation Resource Maximum 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 in section 3.2.3 (f).

(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), or does not operate in the corresponding Real-time Settlement Interval(s) due to compliance with 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), 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 Total Lost Opportunity Cost Offer plus 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.

Market Sellers of Flexible Resources that submit a Real-time Offer greater than their resource's Committed Offer in the Day-ahead Energy Market shall not be eligible to receive compensation for lost opportunity costs under any applicable provisions of Schedule 1 of this Agreement. This prohibition shall not apply to Market Sellers that comply with an Operating Instruction issued by the Office of the Interconnection to switch to an alternative fuel type or fuel source, in accordance with Tariff, Attachment K-Appendix, section 3.2.3(s) and the parallel provisions of Operating Agreement, Schedule 1, section 3.2.3(s).