

Parameter Limited Schedules

MIC

December 11, 2019

Market Monitoring Unit



Monitoring Analytics

Summary

- **The OA requires PJM to mitigate the exercise of market power by limiting certain operating parameters.**
- **PJM's PLS implementation does not mitigate the exercise of market power. PJM does not limit the operating parameters specified in the OA under all the conditions specified in the OA.**
- **PJM wants to change the OA to meet PJM's PLS implementation instead of changing PJM's implementation to meet the OA.**

OA Requirement

- **Normal Operations**
 - **Generator is not offer capped.**
 - **Generator is not subject to limits on parameters on price schedule.**
- **Generator fails the TPS Test**
 - **Generator is offer capped.**
 - **Generator is placed on its Parameter Limited Schedule.**
- **Max Emergency, Hot/Cold Weather Alerts**
 - **Generator is not offer capped.**
 - **Generator is placed on its Parameter Limited Schedule.**

PJM 2008 Training

Normal Operations



Generators continue on their Price Schedule and non-limited parameters

Generator fails the Three Pivotal Supplier Test (TPS)



Generators are placed on their cost schedule as well as their Parameter-Limited Schedules

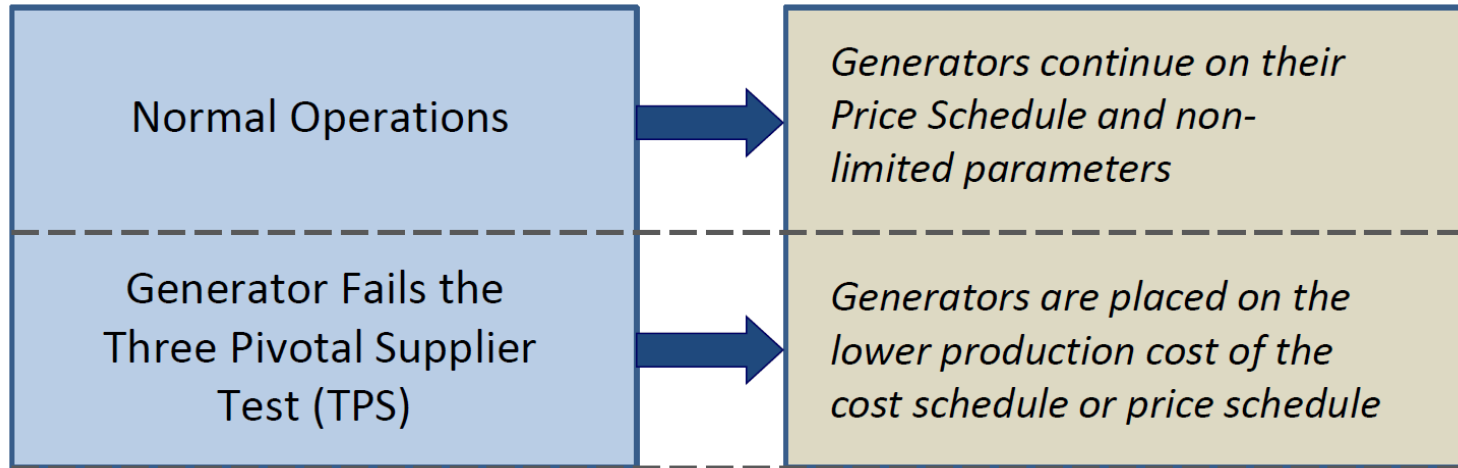
Max Emergency Alert, loading, etc.



Generators continue on their price schedule but placed on their Parameter-Limited Schedules (note: Scarcity Pricing rules may apply)

- **Source: PJM 2008 Balancing Operating Reserve Training.**

PJM Implementation



- **Training specifies that under Max Gen and Hot/Cold Weather resources “may be subject to their Price Parameter-Limited Schedule.”**
- **Source: PJM 2017 Day Ahead Market Training.**

Issue Summary

- **Issue: PJM is not properly mitigating market power.**
 - **Issue 1: When a unit fails the TPS test, PJM can and does commit units with inflexible parameters. This is not compliant with the OA. PJM wants to change the OA to meet its implementation.**
 - **Issue 2: During max gen, hot weather or cold weather alerts, PJM can and does commit units with inflexible parameters. This is not compliant with the OA. PJM states that this is not a compliance issue. The IMM believes that this is a compliance issue.**
- **PJM should modify their PLS implementation to meet the OA.**

Background

- In 2005, the PJM Market Monitor identified that units were able to exercise market power by manipulating operating parameters (e.g. excessive min run time, min down time, etc.).
- The issue was addressed in the Reserve Market Working Group (RMWG).
- After two years (2005 through 2007), the Reserve Market Working Group (RMWG) developed a proposal for the endorsement of the MIC.

2007 RMWG Proposal

- **The RMWG proposal stated that:**
 - **Under the current rule:**
 - “Each generator may submit their operating parameters for individual units when participating in the Day-Ahead and Real time Energy Markets.”

2007 RMWG Proposal

- **The RMWG proposal stated that:**
 - **The desired outcome was:**
 - “It has been recognized that there are issues that result from inconsistent treatment of submitted operating parameters during times of transmission constrained operations and/or maximum generation conditions. It has also been identified by the PJM Market Monitor that there exists potential of generation resources to exercise market power by altering operating parameters in order to increase operating reserves credits.”

2007 RMWG Proposal

- **The RMWG proposal stated that:**
 - **The proposed solution was:**
 - “During times of transmission constrained operations and/or maximum generation conditions, limit operating parameters via unit schedules to be consistent with operating parameters based on the market data for actual PJM market offers by unit class, where relevant.”

2007 RMWG Proposal

- **The RMWG also provided a set of business rules to be implemented.**
- **Regarding parameter limited schedules, the business rules included a “suggested list of business rules to require units to submit schedules that meet minimum accepted parameters.”**



RMWG Proposed Operating Reserve Business Rules

- **“Pre-determined limits on non-price offer parameters for all generation resources, both exempt and non-exempt, will define limits on generation resources’ non-price offer parameters under the following circumstances:**
 - **If the three pivotal supplier test for the operating reserve market defined by transmission constraint(s) is failed, generation resources, both exempt and non-exempt, will be committed on their Parameter-Limited Schedule.”**
- **Note: “Non-price offer parameters” are non-financial offer parameters like minimum run time.**

RMWG Proposed Operating Reserve Business Rules

- **“For exempt units, the Parameter-Limited Schedule will be used with the existing price offer for the day such that the price components of the offer may not change as a result;**
- **For exempt and non-exempt units, the Parameter-Limited Schedule shall be the less limiting of the defined Parameter-Limited Schedules or the submitted offer parameters.”**



RMWG Proposed Operating Reserve Business Rules

- **“In the event that 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 for all or any part of such Operating Day, generation resources, both exempt and non-exempt, will be committed on their Parameter-Limited Schedule.”**

RMWG Proposed Operating Reserve Business Rules

- **“Non-exempt generation resources will be required to submit an additional price schedule specifying the unit’s predefined non-price parameter limits. This schedule will be identified as the unit’s “parameter limited” schedule. The unit’s cost-based schedule(s) to be used when the unit is offer-capped for transmission will also need to include the same parameters as the Parameter-Limited Schedule.**
- **Exempt generation resources will be required to submit an additional schedule specifying the unit’s predefined non-price parameter limits. This schedule will be identified as the unit’s Parameter-Limited Schedule.”**

2007 RMWG Proposal

- **This proposal was endorsed by the MIC on June 6, 2007.**
- **This proposal was endorsed by the MC on November 15, 2007.**
- **An additional revision was presented at the June 26, 2018 MC.**



2007 RMWG Proposal

- **PJM filed tariff revisions (ER08-1569) on September 26, 2008. PJM stated that the filing was delayed from 2007 “in order to synchronize the timing of this filing” and the “billing software changes to PJM’s MSET system.”**
- **The tariff revisions were consistent with the RMWG proposal.**
 - **The different treatment of “exempt and nonexempt” resources was removed.**

2008 Tariff Revisions

- **PJM argued that “the current market power mitigation rules provide that when PJM determines that the owner of a unit has the potential to exercise market power, PJM caps the unit at its cost-based energy offer. The mitigation rules, however, do not provide for any limitation of the operating parameters that may be submitted as part of a unit’s cost-based energy offer. During the deliberations of the Reserve Market Working Group, concern was expressed by the PJM Market Monitor that market power could be exerted through the submission of inflexible operating parameters for the sole purpose of increasing a unit’s Operating Reserves credits.”**

2008 Tariff Revisions

- **“In order to address these concerns, PJM is proposing that certain pre-determined limits (“parameter limited schedules”) that are based on the physical parameters of the units should be applied when certain system conditions exist and a unit has the potential to exhibit market power.**
- **These conditions could exist when**
 - **(i) the unit owner fails the three pivotal supplier test, and**
 - **(ii) PJM declares a Maximum Generation Emergency, issues an alert that a Maximum Generation Emergency may be declared (“Maximum Generation Emergency Alert”)...”**

2008 Tariff Revisions

- **Proposed and approved tariff:**
- **(a) Generation resources shall be subject to pre-determined limits on non-price offer parameters (“parameter limited schedules”) under the following circumstances:**
 - **(i) The Operating Reserve markets fail the three pivotal test. When this subsection applies, the parameter limited schedule shall be the less limiting of the defined parameter limited schedules or the submitted offer parameters.**
 - **(ii) The Office of the Interconnection: (i) declares a Maximum Generation Emergency; (ii) issues an [Maximum Generation Emergency Alert]; or (iii) schedules units based on the anticipation of a Maximum Generation Emergency...”**

Summary

- **The goal of the original 2007 PLS approved proposal was to prevent the use of inflexible parameters to exercise market power.**
- **The 2008 tariff revisions reflected that goal. If implemented correctly, it would have prevented the exercise of market power.**



2008 PJM Training

- **PJM's 2008 training was consistent with the RMWG proposal, with the approved OA language.**
- **The training slides stated that “units will be committed on Parameter Limited Schedules when**
 - **The Three Pivotal Supplier (TPS) Test is failed or**
 - **PJM:**
 - declares a Maximum Generation Emergency
 - issues a Maximum Generation Emergency Alert
 - schedules units based on the anticipation of Maximum Generation Emergency...”

2009 Manual Changes

- **On July 31, 2009, PJM made revisions to Manual 11.**
- **Those revisions included some of the business rules proposed by the RMWG and endorsed by the MIC and MC.**
- **Most business rules regarding PLS proposed by the RMWG were included in Manual 11.**
- **The 2009 Manual 11 revisions were consistent with the RMWG proposal, with the approved OA language and with the PJM training.**

2009 Manual Changes

- **“Pre-determined limits on non-price offer parameters for all generation resources will define limits on generation resources’ non-price offer parameters under the following circumstances:**
 - **If the three pivotal supplier test for the operating reserve market defined by transmission constraint(s) is failed, generation resources will be committed on their Parameter-Limited Schedule, as defined below.**
 - **The Parameter-Limited Schedule that is utilized shall be the less limiting of the defined Parameter-Limited Schedules or the submitted offer parameters.”**

2009 Manual Changes

- **“In the event that 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 AlertII); or (iii) schedules units based on the anticipation of a Maximum Generation Emergency or a Maximum Generation Emergency Alert for all or any part of such Operating Day, generation resources will be committed on their Parameter-Limited Schedule.”**

2009 Manual Changes

- **“Generation resources will be required to submit an additional price schedule specifying the unit’s predefined non-price parameter limits. This schedule will be identified as the unit’s parameter limited schedule. The unit’s cost-based schedule(s) to be used when the unit is offer-capped for transmission will also need to include the same parameters as the Parameter Limited Schedule.”**

Summary

- **The goal of the original 2007 PLS approved proposal was to prevent the use of inflexible parameters to exercise market power.**
- **The 2008 tariff revisions reflected that goal. If implemented correctly, it would have prevented the exercise of market power.**
- **The 2008 PJM training reflected that goal.**
- **The 2009 Manual 11 revisions reflected that goal.**
- **PJM's software implementation did not incorporate the stated design.**

2014 CP Filing

- **Capacity Performance (CP) introduced several changes to PLS. The main ones were:**
 - **Additions to the list of limited parameters (notification times, start times and max run time).**
 - **More flexible parameter limits (based on technical documentation).**
 - **New conditions under which PLS applies: hot and cold weather alerts.**

2014 CP Filing

- In the CP filing, PJM replaced the words “non-price offer parameters” with parameter limitations.
 - Non-price offer parameters meant operating parameters rather than price (financial) parameters (e.g. incremental offer, no load cost, start cost).
 - PJM removed “Operating Reserve markets” as there is no such thing in PJM. Operating Reserve referred to the Operating Reserve section of the OA which governs uplift payments.
 - PJM added hot and cold weather alerts as new conditions under which parameter limitations apply.

2014 CP Filing - OA Revisions

6.6 Minimum Generator Operating Parameters – Parameter Limited Schedules.

(a) Market Sellers submitting Offer Data for Generation Capacity Resources shall submit and be subject to pre-determined limits on cost-based offers, which are always parameter limited. Market Sellers submitting Offer Data for Generation Capacity Resources shall submit and be subject to pre-determined limits on market-based offers conforming to parameter limitations~~non-price offer parameters~~ (“parameter limited schedules”) under the following circumstances:

(i) The ~~Operating Reserve markets~~ Market Seller ~~fails~~ the three pivotal supplier test. When this subsection applies, the parameter limited schedule shall be the less limiting, i.e. more flexible, of the defined parameter limited schedules or the submitted offer parameters.

2014 CP Filing - OA Revisions

(ii) For the 2014/2015 through 2017/2018 Delivery Years, the Office of the Interconnection: (i) declares a Maximum Generation Emergency; (ii) issues ~~an alert that~~ Maximum Generation Emergency may be declared (“a Maximum Generation Emergen Alert”); or (iii) schedules units based on the anticipation of a Maximum Generation Emergen or a Maximum Generation Emergency Alert for all, or any part, of an Operating Day.

(iii) For Capacity Performance Resources, the Office of the Interconnection: declares a Maximum Generation Emergency; (ii) issues a Maximum Generation Emergen Alert, Hot Weather Alert, Cold Weather Alert; or (iii) schedules units based on the anticipati of a Maximum Generation Emergency, Maximum Generation Emergency Alert, Hot Weath Alert or Cold Weather Alert for all, or any part, of an Operating Day.

Summary

- **The goal of the original 2007 PLS approved proposal was to prevent the use of inflexible parameters to exercise market power.**
- **The 2008 tariff revisions reflected that goal. If implemented correctly, it would have prevented the exercise of market power.**
- **The 2008 PJM training reflected that goal.**
- **The 2009 Manual 11 revisions reflected that goal.**
- **PJM's software implementation did not meet the goal.**
- **The 2014 CP filing did not change the initial goal.**

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