

2.3.7 Mechanical/Technical Rules

A valid generator offer consists of the following elements:

For a Generation Capacity Resource a valid generator offer consists of a parameter limited price-based schedule (if the unit is price-based) and at least one cost-based schedule. The default values for the schedules are:

- Day-ahead Market switch is yes (1).
 - Balancing market switch is yes (1).
 - Use start-up & no-load switch is yes (1).
 - Use offer slope switch is no (0).
 - Condense available switch is blank or no (0).
 - Startup and no load costs are zero.
 - Hourly economic max/min and emergency max/min are the unit level economic and emergency MW limits, respectively.
 - Minimum down time, minimum run time, start times, and notification times are zero.
 - Maximum run time and maximum number of starts per week are infinity.
 - The default for incremental offer curve data is \$0. If the last MW point on the segment curve is less than the maximum emergency limit, then the curve is extended up to the emergency maximum limit using zero slope from the last incremental point on the curve.
- In order to qualify for exempt or bonus MWs during a Performance Assessment Hour, in accordance with Manual 18, Non-Performance section, each generation resource must have at least one available schedule. Each offer must have the following:
- Economic Minimum value [zero or non-zero value]
 - Economic Maximum value [zero or non-zero value]
 - Emergency Maximum value [zero or non-zero value]
 - At least one available schedule, which must have at least one segment on the incremental offer curve

For a non-Capacity Resource, a valid generator offer consists of a price-based schedule (if the unit is price-based) and at least one cost based schedule. The default values for the schedules are:

- Day-ahead Market switch is yes (1).
- Balancing market switch is yes (1).

- Use start-up & no-load switch is yes (1).
 - Use offer slope switch is no (0).
 - Condense available switch is blank or no (0).
 - Startup and no-load costs are zero.
 - Hourly economic max/min and emergency max/min are the unit level economic and emergency MW limits, respectively.
 - Minimum down time, minimum run time, start times, and notification times are zero.
 - Maximum run time and maximum number of starts per week are infinity.
 - The default for incremental offer curve data is \$0. If the last MW point on the segment curve is less than the maximum emergency limit, then the curve is extended up to the emergency maximum limit using zero slope from the last incremental point on the curve.
 - External resources can only submit start up and no load costs if the entire output of the unit is available for PJM dispatch
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- In order to qualify for exempt or bonus MWs during a Performance Assessment Hour, in accordance with Manual 18, Non-Performance section, each generation resource must have at least one available schedule. Each offer must have the following:
 - Economic Minimum value [zero or non-zero value]
 - Economic Maximum value [zero or non-zero value]
 - Emergency Maximum value [zero or non-zero value]
 - At least one available schedule, which must have at least one segment on the incremental offer curve

Valid offers for demand bids, price sensitive and fixed, consist of the following items:

- MW, with a default value of 0 MW. Demand bids should not include losses.
- Location (transmission zone, aggregate, or single bus)
- Price at which demand shall be curtailed (for price-sensitive bids)
- PJM shall apply Demand Bid Screening to all Demand Bids submitted in the Day-Ahead Energy Market for each LSE, separately by Zone. PJM will automatically reject a LSE's Demand Bids if the total MW volume of such bids exceeds the LSE's Demand Bid limit for any hour in such Operating Day.
- On a daily basis, PJM will update and post each LSE's Demand Bid Limit in each applicable Zone. Such Demand Bid Limit will apply to all Demand Bids submitted by that LSE for each future Operating Day for which it submits bids.
- The Demand Bid Limit is calculated using the following equation:

Demand Bid Limit = greater of (Zonal Peak Demand Reference Point * 1.3), or
(Zonal Peak Demand Reference Point + 10MW)

Where:

- Zonal Peak Demand Reference Point = for each Zone: the product of (a) LSE's Recent Load Share, multiplied by (b) Peak Daily Load Forecast.
 - LSE's Recent Load Share is the LSE's highest share of Network Load in each Zone for any hour over the previous seven Operating Days.
 - Peak Daily Load Forecast is PJM's highest available peak load forecast for each applicable Zone that is calculated on a daily basis.
- PJM may allow a LSE to submit bids in excess of its Demand Bid Limit when circumstances exist that will cause, or are reasonably expected to cause, a LSE's actual load to exceed its Demand Bid Limit on a given Operating Day. Examples of such circumstances include, but are not limited to, changes in load commitments due to state sponsored auctions, mergers and acquisitions between PJM Members, and sales and divestitures between PJM Members.
 - A LSE whose Demand Bids are rejected as a result of Demand Bid Screening may change the Demand Bids to reduce the total megawatt volume to a level that does not exceed the Demand Bid Limit. Re-submissions must occur prior to Market closing for the operating day.

8.4A Non-Performance Assessment

Effective with the 2018/2019 Delivery Year³², a new Non-Performance Assessment³³ will assess performance of resources during emergency conditions. Non-Performance Assessment applies to both Base Capacity Resource and Capacity Performance Resource commitments. Base Capacity Resource commitments are exposed to Non-Performance Charges only for under-performance during Emergency Actions in summer months of June through September. Capacity Performance Resource commitments are exposed to Non-Performance Charges for under-performance during Emergency Actions throughout the entire Delivery Year. Resources that fail to perform are subject to Non-Performance Charge and resources that over-perform may be eligible for Bonus Performance Credit.

Implementation of the Non-Performance Assessment will eliminate Peak Season Maintenance Compliance and Peak-Hour Period Availability Assessment for generation resources and Load Management Event Compliance for Demand Resources.

The Non-Performance Assessment will compare each Capacity Resource's Expected Performance against its Actual Performance for each Performance Assessment Hour. Performance Assessment Hours are delineated by PJM's declaration of Emergency Actions. Emergency Actions shall mean any emergency action for locational or system-wide capacity shortages that either utilizes pre-emergency mandatory load management reductions or other emergency capacity, or initiates a more severe action, including but not limited to, a Voltage Reduction Warning, Voltage Reduction Action, Manual Load Dump Warning, or Manual Load Dump Actions. Performance is assessed for each hour (or partial hour) that PJM declares the following actions:

- Pre-Emergency Load Management Reduction Action
- Emergency Load Management Reduction Action
- Primary Reserve Warning
- Maximum Generation Emergency Action
- Emergency Voluntary Energy Only Demand Response Reductions
- Voltage Reduction Warning and Reduction of Non-Critical Plant Load
- Curtailment of Non-Essential Business Load
- Deploy All Resources Action
- Manual Load Dump Warning
- Voltage Reduction Action
- Manual Load Dump Action
- Load Shed Directive

The Non-Performance Assessment will encompass all resources located in the area defined by the Emergency Action. If the Emergency Action area is PJM-wide then External Generation Capacity Resources and Net Energy Imports are included in this assessment. QTUs will be deemed to be located in the LDA into which such upgrade increased the CETL and the QTU will be included in the Non-Performance Assessment only if, and to the extent that, the declared Emergency Action encompasses only the LDA into which the upgrade increased the CETL.

For each Performance Assessment Hour, the Actual Performance and the Expected Performance is used to calculate a Performance Shortfall that determines both the Non-Performance Charge and Bonus Performance Credit applicability.

For each Performance Assessment Hour, the Actual Performance is equal to:

- for each generation resource (including External Generation Capacity Resources for PJM-wide events), the metered output of delivered energy plus the resource's real-time reserve or regulation assignment, if any; however, the resulting MW quantity is floored at 0 MW;
- for each Demand Resource, the demand response provided plus the resource's real-time reserve or regulation assignment, if any;
- for each Energy Efficiency Resource, the load reduction quantity approved by PJM subsequent to the pre-delivery year submittal of a post-installation M&V Report;
- for each entity providing Net Energy Imports during a PJM-wide event, the Net Energy Import quantity excluding any energy delivered from External Generation Capacity Resources ; and,
- for each Qualified Transmission Upgrade, the cleared MW quantity of the QTU if it is in-service prior to the start of the day of the Performance Assessment Hour, and zero if it is not in-service prior to the start of such day.

For each Performance Assessment Hour, the Expected Performance is equal to:

- for each generation resource (including External Generation Capacity Resources for PJM-wide events), the resource's committed Unforced Capacity times the ratio of [(total amount of Actual Performance for all generation resources, plus net energy imports, plus total Demand Response Bonus Performance for that hour) / (total amount of committed Unforced Capacity of all Generation Capacity Resources)]; and,
- for each Demand Resource and Energy Efficiency Resource, the resources' committed capacity without making any adjustment for the Forecast Pool Requirement (i.e., the actual load reduction quantity the resource committed to provide); and,
- for each Qualified Transmission Upgrade, the committed MW quantity.

The Performance Shortfall for a resource is calculated as Expected Performance minus the Actual Performance. If the Performance Shortfall for such resource is a positive number, the under-performing resource is subject to a Non-Performance Charge. If the Performance Shortfall is a negative number, the over-performing resource may be eligible for Bonus Performance Credit.

For generation resources with a positive Performance Shortfall amount, the Performance Shortfall may be adjusted downward due to exempt MWs. Exempt MWs consist of the following:

- Unavailable MWs associated with a generator's approved planned or maintenance outage during the Performance Assessment Hour;
- MWs for which the resource was not scheduled to operate by PJM; or
- MWs for which the resource was on-line but was scheduled down by PJM based on the determination by PJM that such scheduling action was appropriate to the security constrained economic dispatch of the PJM Region.
- If such resource was needed by PJM and would otherwise have been scheduled by PJM to perform, but was not scheduled to operate, or was scheduled down solely due to (1)

any operating parameter limitations submitted in the resource's offer or (2) submission of a market-based offer higher than its cost-based offer, then these MWs will not be considered exempted and will not result in a downward adjustment to the Performance Shortfall.

- For purposes of the Non-Performance Assessment for demand resources, compliance will be measured in accordance with Section 8.7 of this manual.
- During the Performance Shortfall calculation and the exempt MW determination, PJM will ensure that each energy offer complies with Manual 11, Section 2.3.7 and has the required associated information. If this information is not included, then no MWs will be exempt.

For Non-Performance Assessment purposes, the Actual Performance of any resource that has both Base Capacity Commitments and Capacity Performance Commitments will first be assigned to meet the resource's Expected Performance as a Capacity Performance Resource with any remaining Actual Performance next assigned to meet the resource's Expected Performance as a Base Capacity Resource.

For Non-Performance Assessment purposes during the 2016/2017 and 2017/2018 transition years, the Actual Performance of any generation resource that has both an Annual Resource commitment and a Capacity Performance commitment will first be assigned to meet the resource's Expected Performance as a Capacity Performance Resource. Actual Performance above the resource's Expected Performance will then be assigned to meet the resource's Annual commitment with any remaining Actual Performance used for purposes of determining Bonus Performance.

For Performance Assessment Hours occurring outside of the summer period (June-September), Generation Capacity Resources that have a Base Capacity commitment, and Base Capacity Demand Resources, are not evaluated for non-performance, but are eligible for Bonus Performance Credit. For Base Capacity Generation Resources, the Bonus Performance quantity is equal to the resource's Actual Performance minus the resource's Expected Performance. For Base Capacity Demand Resources, the Bonus Performance quantity is equal to the resource's Actual Performance.

For purposes of calculating Bonus Performance quantity, the Actual Performance for a dispatchable resource shall not exceed the MW level at which such resource was scheduled and dispatched by PJM during the Performance Assessment Hour. During the Bonus Performance quantity calculation, PJM will ensure that each energy offer complies with Manual 11, Section 2.3.7 and has the required associated information associated. If this information is not included, then the Bonus Performance quantity will be zero. For self-scheduled generation resources not dispatchable by PJM, the Actual Performance will not exceed the LMP Desired MW value as calculated by PJM based upon the higher of the cost or price schedules submitted for the resource, and will be zero if the LMP Desired MW is less than the lowest point on the higher of the cost or price schedules submitted for the resource.

The hourly Non-Performance Charge is calculated as Performance Shortfall multiplied by the Non-Performance Charge Rate. The Non-Performance Charge Rate for Capacity Performance commitments is equal to [the modeled LDA Net CONE (\$/MW-day in installed capacity terms) for which the resource resides times 365 days] divided by 30. The modeled LDAs and their respective Net CONE are provided in the Delivery Year BRA Planning Parameters posted on the PJM website.

The hourly Non-Performance Charge Rate for Base Capacity commitments is equal to (Weighted Average Resource Clearing Price (\$/MW-day) for such resource times 365 days)divided by 30. The number 30 is intended to represent the number of hours during a year that Emergency Actions could reasonably be expected to be in effect. Stop-loss provisions limit the total Non-Performance Charge that can be assessed on each Capacity Resource.

For Capacity Performance Resources, the maximum yearly Non-Performance Charge is 1.5 times the modeled LDA Net CONE (\$/MW-day in installed capacity terms) times 365 days times the maximum daily unforced capacity committed by the resource during June 1 of the Delivery Year through the end of the month for which the Non-Performance Charge was assessed. For Seasonal Capacity Performance Resources, the maximum yearly Non-Performance Charge is based the number of days of the applicable season and the maximum daily unforced capacity committed by the resource for such season. The modeled LDAs and their respective Net CONE are provided in the Delivery Year BRA Planning Parameters posted on the PJM website.

For Base Capacity Resources, there is an annual limit on total Non-Performance Charges, equal to the total capacity revenues due to the resource for the Delivery Year.

Revenue collected from payment of Non-Performance Charges will be distributed to resources (of any type, even if they are not Capacity Resources) that perform above expectations. A resource with Actual Performance above its Expected Performance is considered to have provided Bonus Performance, and will be assigned a share of the collected Non-Performance Charge revenues in the form of a Bonus Performance Credit. This credit is based on the ratio of its Bonus Performance quantity to the total Bonus Performance quantity (from all resources) for the same Performance Assessment Hour.

The Non-Performance Assessment will apply to resources with Capacity Performance commitments for the 2016/2017 or 2017/2018 Delivery Year; however the Non-Performance Charge for the 2016/2017 Delivery Year is based on 50 percent of the Non-Performance Charge Rate and the Non-Performance Charge for the 2017/2018 Delivery Year is based on 60 percent of the Non-Performance Charge Rate. The maximum Non-Performance Charge exposure in the stop-loss calculation is correspondingly reduced such that for 2016/2017, the maximum yearly Non-Performance Charge is 0.75 times Net CONE times the maximum daily unforced capacity committed by the resource during June 1 of the Delivery Year through the end of the month for which the Non-Performance Charge was assessed. For the 2017/2018 Delivery Year, the maximum yearly Non-Performance Assessment Charge is 0.9 times Net CONE times the maximum daily unforced capacity committed by the resource during June 1 of the Delivery Year through the end of the month for which the Non-Performance Charge was assessed. Total revenues collected from Non-Performance Charges for a Performance Assessment Hour during the 2016/2017 or 2017/2018 Delivery Year will be allocated only to over-performing capacity resources with a Capacity Performance commitment.

The billing of any Non-Performance Charges incurred in any given month will be done within three calendar months after the calendar month that included such Performance Assessment Hours and such billing of charges will be spread over the remaining months in the Delivery Year. Bonus Performance Credits will follow the same billing methodology as Non- Performance Charges.