

PJM Manual 11:

Energy & Ancillary Services Market Operations

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Day-Ahead and Real-Time Market Operations

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2.3.3.1 Parameter Limits

Different limits may be applied to certain schedule parameters depending on a unit's Capacity commitment type and the applicable Delivery Year.

- PJM will define a list of minimum acceptable operating parameters for the 2018/2019 Delivery Year for generation resources of FRR Entities not committed as Base Capacity Resources or Capacity Performance Resources, based on an analysis of historically submitted offers, for each unit class for the following parameters:
 - Turn Down Ratio
 - Minimum Down Time
 - Minimum Run Time
 - Maximum Daily Starts
 - Maximum Weekly Starts
- For Capacity Performance Resources, and for the 2018/2019 and 2019/2020 Delivery Years for Base Capacity Resources, the list of minimum acceptable operating parameters will consist of the following parameters:
 - Turn Down Ratio
 - Minimum Down Time
 - Minimum Run Time
 - Maximum Daily Starts
 - Maximum Weekly Starts
 - Maximum Run Time
 - Start Up Time
 - Notification Time
- For the 2018/2019 Delivery Year for generation resources of FRR Entities not committed as Capacity Performance Resources or Base Capacity Resources the limits set forth in the Parameter Limited Schedule Matrix shall apply, unless the generation resource is operating pursuant to an exception from the default values due to physical operational limitations that prevent the resource from meeting the minimum parameters. The Parameter Limited Schedule Matrix is found in Section 6.6(c) of Attachment K-Appendix of the Tariff and the parallel provision of Schedule 1 of the Operating Agreement found at: <https://www.pjm.com/library/governing-documents.aspx>.
 - For the Delivery Years up to and including the 2018/2019 Delivery Year, the MMU shall review the Parameter Limited Schedule Matrix, included in Section 6.6(c) of Attachment K-Appendix of the Tariff and the parallel provision of Schedule 1 of the Operating Agreement, annually, and, in the event it determines that revision is appropriate, shall provide a revised matrix to PJM by no later than December 31 that occurs immediately prior to the commencement of the applicable Delivery Year.
- For Capacity Performance Resources and for the 2018/2019 and 2019/2020 Delivery Years for Base Capacity Resources, PJM will determine for each such resource its unit-specific parameter limits based on the operating design characteristics and other constraints of that resource. The resource's unit-specific parameter limits will apply for

that resource unless it is operating pursuant to an exception from those limits under section 6.6(h) of Attachment K-Appendix of the Tariff and the parallel provision of Schedule 1 of the Operating Agreement due to operational limitations that prevent it from meeting the minimum resource parameters.

- Failure of a Generation Owner to conform to the unit-specific values determined by the Office of the Interconnection during the Operating Day without submitting a Temporary Exception, Period Exception, Persistent Exception, or Real Time Value as described below is a violation of Operating Agreement, Schedule 1, section 6.6 and the parallel provisions of Tariff, Attachment K-Appendix, section 6.6 and PJM always has the ability to refer a Market Seller to Federal Energy Regulatory Commission for further investigation.

2.3.3.2 Unit Specific Parameter Adjustments

- Market Sellers that do not believe their individual resources can meet the unit-specific parameter limits determined by PJM due to actual operating constraints, can request that PJM establish adjusted unit-specific parameter limits for those resources. The Market Seller may request adjusted unit-specific parameter limits by providing all the necessary data, information and documentation to PJM in order to justify and support the adjusted unit-specific parameter limits at unitspecificpls@pjm.com by no later than the February 28 immediately preceding the first Delivery Year for which the adjusted unit-specific parameter limits are requested to commence, and provide technical information about the operational limits that support the requested adjustment. PJM shall notify the Market Seller if its request was approved or denied by no later than April 15. The effective date of the requested parameter shall be no earlier than June 1 of the first applicable Delivery Year. PJM will consult with the Market Monitoring Unit and consider any input received in its determination of a resource's unit-specific parameter limits.
- Once PJM has made a determination of the unit-specific parameter limited schedule values for a Generation Capacity Resource, those values will remain applicable to the resource until such time as the Office of the Interconnection determines that a change is needed based on changed operational capabilities of the resource.
- The operational limitations that support adjusted unit-specific parameter limits shall be (a) physical operational limitation based on operating design characteristics of the resource, or (b) other actual physical constraints that are not based on the characteristics of the resource, including contractual limitations. For a contractual limit to be considered a physical constraint which the Market Seller should be permitted to reflect in its unit-specific parameter limits for the resource, and not an economic constraint which should not be taken into consideration in the determination of the unit-specific parameter limits for that resource, the contractual limit must be based on a natural gas pipeline transportation contract that is for the best available service offered by the pipeline and available to the Market Seller rather than a lower cost option that provides less flexible service. For example, if a pipeline offers hourly nominations and/or no notice service, the resource's operational parameters will be based on those more flexible services that are available even if a less flexible service is procured.
- Only actual physical operational limitations, fuel contractual constraints, environmental limitations and other actual constraints on a resource will be considered for adjustment requests. The following list is not an exhaustive list, but provides examples of the types of information and documentation PJM would request to support adjusted unit-specific parameter limits requests:

- o Start Up Time adjustments –OEM (Original Equipment Manufacturer) backup documentation, control room data, startup/loading curves and a detailed start-up sequence listing the required steps along with the time required to perform each step.
- o Maximum Daily/Weekly Starts adjustments –OEM backup documentation and/or detailed start-up and shutdown sequences that show why the default start parameters cannot be physically met.
- o Minimum Run Time adjustments –OEM backup documentation for physical unit constraints that requires the unit to be operated for the requested time period.
- o Minimum Down Time adjustments - OEM backup documentation and a detailed shut down sequence listing the required steps to bring the unit into a ready for startup condition along with the time required to perform each step.
- o Notification Time Adjustment –A detailed sequence of events of the tasks required prior to startup along with the time required to perform each step. In addition gas pipeline contracts may be submitted for review.
- o Turn Down Ratio Adjustments –Requests for adjustments to this parameter based on physical equipment limitations should include OEM backup documentation describing the equipment limitation. Requests for adjustments to this parameter based on emissions permit limitations and related concerns will require inclusion of the applicable Air Permit as well as emissions data for justification.

2.3.3.3 Parameter Limited Schedule Exceptions

- There are three different types of exceptions to the Parameter Limited Schedule Matrix default values:
 - o **Temporary Exception** – is a one-time exception lasting for 30 days or less during the twelve month period from June 1 to May 31.
 - o **Period Exception** – is an exception lasting for at least 31 days but no more than one year **during** the twelve month period from June 1 to May 31.
 - o **Persistent Exception** – is an exception lasting for at least one year.
- Pursuant to section II.B of Attachment M – Appendix of the Tariff, period and persistent exception requests must be sent to Parameters.Exceptions@pjm.com by no later than February 28 immediately preceding the twelve month period from June 1 to May 31 during which the exception is requested to commence.
- All Market Sellers that wish to submit a Parameter-Limited Schedule for units with physical operational limitations that prevent the units from meeting the minimum parameters may submit a request for an exception via Markets Gateway for evaluation.
- Each Market Seller seeking an exception must supply the required historical unit operating data in support of the period or persistent exception and if the exception requested is based on new physical operational limits for the resource for which historical operating data is unavailable, the generation resource may also submit technical information about the physical operational limits for period exceptions of the resource to support the requested parameters.
- Physical operational limitations for period or persistent exceptions may include but are not limited to, metallurgical restrictions due to age and long term degradation;

physical design modifications; operating permit limitations; operating limits imposed by federal, state or local regulatory requirements or insurance carrier requirements; consent decrees; manufacturer technical bulletins; or environmental permit limitations under non-emergency conditions.

- Each Market Seller requesting a period or persistent exception based on new physical operational limitations for a unit may submit the technical information, required due to the unavailability of historical operating data, supporting the requested parameters, which must be based on the definition of physical operational limitations for period or persistent exceptions of the unit.
- Each temporary, period or persistent exception request will indicate the expected duration of the requested exception including the date on which the requested exception period will end. If physical conditions at the unit change such that the exception is no longer required, the Market Seller is obligated to inform PJM and the MMU and the exception will be reviewed to determine if the exception continues to be appropriate.
- If a request for a period or persistent exception is received by February 28, the MMU will review the exception and provide the Market Seller and PJM with a determination in writing whether the request raises market power concerns by April 1, and PJM shall provide its determination whether the request is approved or denied by no later than April 15. Should PJM require additional technical expertise in order to evaluate the exception request, PJM will engage the services of a consultant with the required expertise. A generation resource shall notify the MMU and PJM when the temporary exception commences and terminates and provide to the MMU and PJM within three days following such commencement documentation explaining in detail the reasons for the temporary exception, that includes:
 - o Unit Name
 - o Parameter Limit Requested
 - o Reason for Temporary Exception Request
 - o eDart ticket
 - o Justification for Temporary Exception Request, including required unit operating data in support of the exception
 - o Date on which the exception period will end.
- If PJM does not receive a complete exception request, and the unit did not clear in the Day-ahead Energy Market, the unit schedule will be returned to its previous parameter limits.
- Physical operational limitations for temporary exceptions may include, but are not limited to, short term equipment failures, short term fuel quality problems such as excessive moisture in coal fired units, or environmental permit limitations under non-emergency conditions.
- Market Sellers may use exceptions to reflect physical operational limitations (e.g., operational flow orders) on natural gas pipelines and local natural gas distribution companies (LDC). These exceptions will be reviewed by PJM and the MMU and approved by PJM, in accordance with the applicable provisions of the Tariff and Operating Agreement.
- In addition, physical operational limitations for temporary exceptions may include any physical operational limitation for period exceptions that arises during the annual period

from June 1 to May 31 to which period exceptions apply.

- Market sellers may indicate to PJM and the MMU those units with the ability to operate on multiple fuels. Multiple-fuel units may submit a parameter-limited schedule associated with each fuel type. All Parameter-Limited Schedules must be submitted via Markets Gateway seven days prior to the beginning of each period beginning June 1. Any exceptions required for any of the parameter-limited schedules submitted for multiple-fuel units will be required to be submitted and approved via the exception process, by the applicable deadlines.
- If physical conditions at the unit change such that the exception is no longer required, the Market Seller is obligated to inform PJM and the MMU and the exception will be terminated.
- Market Sellers shall notify in writing the MMU and the PJM of a material change to the facts relied upon by the MMU and/or the PJM to support a temporary, period or persistent exception. MMU will provide written notice of any change to its determination regarding the exception request within 15 days of receipt of such notice to PJM and the Market Seller. PJM will notify the Market Seller and MMU in writing, by no later than 20 days after receipt of the Market Seller's notice, whether it is revoking or confirming its approval of the exception request.
 - o If PJM determines that its approval of the exception should be revoked or terminated, (1) for Generation Capacity Resources that are not Base Capacity Resources or Capacity Performance Resources the default values specified in the Parameter Limited Schedule Matrix shall apply, (2) for Base Capacity Resources and Capacity Performance Resources without approved adjusted unit-specific values, the unit-specific values determined by PJM shall apply, and (3) for Base Capacity Resources and Capacity Performance Resources with approved adjusted unit-specific values, the adjusted unit-specific values shall apply. PJM shall notify the Market Seller 3 business days before such revocation.

2.3.3.4 Real Time Values

- Real Time Values can be used to communicate a resource's current operational capabilities to PJM before and after Day-ahead Energy Market closes through the 'Real Time Values' function in Markets Gateway.
- Real Time Values can also be used to override a resource's unit specific parameter limits if a resource is or will become unable to achieve the unit-specific parameter values and was unable to submit a request for a Temporary, Period, or Persistent Exception due to market timing.
- Real Time Values should be utilized when a resource cannot operate according to the unit specific parameters (Capacity Performance and Base Capacity resources), default Parameter Limited Schedules (non-Capacity Performance resources), or approved Parameter Limit exceptions.
- If Real Time Values are used during a Hot Weather Alert, Cold Weather Alert, or Maximum Generation Emergency, the Market Seller shall provide, within three days of using submitting the Real Time Value, a certification from the Market Seller that the operating capability of a resource could not operate to its unit specific parameter limits or approved parameter limited exceptions, along with detailed documentation explaining the reasons for the use of the Real Time Value; including historical unit

operating data and/or technical information about the physical operational limits of the unit to support the use of the Real Time Value. All responses to additional requests for information shall be responded to within three Business Days after such request. Failure to provide the requisite certification or documentation supporting an actual constraint on the unit or insufficient documentation to demonstrate the justified use of a Real Time Value during a Hot Weather Alert, Cold Weather Alert, or Maximum Generation Emergency is a violation of Operating Agreement, Schedule 1, section 6.6 and the parallel provisions of Tariff, Attachment K-Appendix, section 6.6. Nothing in this provision precludes PJM from making a referral to FERC Office of Enforcement if no documentation is provided or, after review of documentation, it determines in consultation with the Market Monitoring Unit that the values do not reflect actual physical operational capabilities.

- Each use of a Real Time Value is valid for one operating day, which shall expire at the end of such operating day.
- The parameters eligible for Real Time Value overrides consist of the following values:
 - o Turn Down Ratio
 - o Minimum Down Time
 - o Minimum Run Time
 - o Maximum Run Time
 - o Start Up Time
 - o Notification Time
- A Generation Capacity Resource that operates outside of its unit-specific parameters will not receive Operating Reserve Credits nor be made whole for such operation when not dispatched by the Office of the Interconnection, unless the Market Seller of the Generation Capacity Resource can justify to the Office of the Interconnection that operation outside of such unit-specific parameters was the result of an actual constraint.

Such Market Seller shall provide to the Market Monitoring Unit and the Office of the Interconnection (unitspecificmakewhole@pjm.com) its request to receive Operating Reserve Credits and/or to be made whole for such operation, along with documentation explaining in detail the reasons for operating its resource outside of its unit-specific parameters, within thirty calendar days following the issuance of billing statement for the Operating Day. The Market Seller shall also respond to additional requests for information from the Market Monitoring Unit and the Office of the Interconnection. The Market Monitoring Unit shall evaluate such request for compensation and provide its determination of whether there was an exercise of market power to the Office of the Interconnection by no later than twenty-five calendar days after receiving the Market Seller's request for compensation. The Office of the Interconnection shall make its determination whether the Market Seller justified that it is entitled to receive Operating Reserve Credits and/or be made whole for such operation of its resource for the day(s) in question, by no later than thirty calendar days after receiving the Market Seller's request for compensation.