

ERCOT Business Practice:

Procedure for Calculating RRS Limits for Individual Resources

**Version 1.0**

Document Revisions

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PROTOCOL DISCLAIMER

This Business Practice describes ERCOT Systems and the response of these systems to Market Participant submissions incidental to the conduct of operations in the ERCOT Texas Nodal Market implementation and is not intended to be a substitute for the ERCOT Nodal Protocols (available at http://www.ercot.com/mktrules/nprotocols/current), as amended from time to time. If any conflict exists between this document and the ERCOT Nodal Protocols, the ERCOT Nodal Protocols shall control in all respects.

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Responsive Reserve Service

Response Reserve Service (RRS) is an operating reserve on Generation Resources, Load Resources, and Resources capable of providing Fast Frequency Response (FFR) maintained by ERCOT to help control the frequency of the system. RRS on Generation Resources and Controllable Load Resources (CLR) can be used to provide released to SCED during scarcity conditions as outlined in the Nodal Operating Guide section 4.8 Responsive Reserve Service During Scarcity Conditions.

# Calculating RRS MW Limits for Individual Resources

ERCOT shall establish MW limits for providing RRS for each Resource based on its performance during Frequency Measurable Events (FME). The MW limit shall be based on the mean/median Resource and CLR performance during the last ten FMEs. The default MW limit for any Generation Resource providing RRS that has not been evaluated for at least ten FMEs, shall be set to 20% of its HSL. A Private Use Network (PUN) with a registered Resource may use its gross HSL for qualification and establishing a limit on the amount of RRS capacity that the Resources within the PUN can provide.

The MW Limit for each Resource is calculated using the droop performance during each FME. The mean/median of the last ten calculated MW Limits will be the MW Limit for each individual Resource. The Calculated Droop Performance and RRS MW Limit for each FME is calculated as follows:

$$Calculated Droop Performance (Droop)=\frac{(Unit\_{HSL}-NFRC) \*(∆Hz -Unit\_{DB})}{ScheduledFrequency \* ∆MW}$$

$$Calculated RRS MW Limit= \frac{0.01\*ScheduledFrequency}{ScheduledFrequency\*Droop-Unit\_{DB}}$$

If a Resource’s performance during an FME is excluded per the current process (BAL-TRE-001) from the rolling average calculation, the Resource’s performance will also be excluded from the RRS MW Limit calculation.

## Calculation Definitions

**Delta Hertz (∆Hz):** The pre-perturbation [the 16-second period of time before t(0)] average frequency minus the post-perturbation [the 32-second period of time starting 20 seconds after t(0)] average frequency

**Delta MW (∆MW):** The pre-perturbation average MW of the Resource minus the post-perturbation average MW of the Resource

**Scheduled Frequency:** The frequency value to be maintained on the system, always 60 Hz

**Non-Frequency Responsive Capability (NFRC):** The telemetered portion of a Generation Resource’s HSL that represents the sustainable non-Dispatched power augmentation capability from duct firing, inlet air cooling, auxiliary boilers, or other methods which does not immediately respond, arrest, or stabilize frequency excursions during the first minutes following a disturbance without secondary frequency response or instructions from ERCOT

**Unit Dead Band (UnitDB):** The range of deviations of system frequency (+/-) that produces no PFR

# RRS MW Limit Updates

ERCOT will recalculate the MW Limit on each individual Resource on a rolling basis utilizing the last ten evaluated FMEs. ERCOT shall post on the MIS Certified area the MW limit for each Resource providing RRS for each quarter by the 20th day of the first month of the previous quarter. For example, for the first quarter of the year, ERCOT shall post the MW Limit for each Resource by October 20th of the previous year.