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| NPRR Number | [1011](http://www.ercot.com/mktrules/issues/nprr1011) | NPRR Title | RTC – NP 8: Performance Monitoring |
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| Date | | October 23, 2020 | |
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| Submitter’s Information | | | |
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| Company | | ERCOT | |
| Phone Number | | 512-248-6998 | |
| Cell Number | |  | |
| Market Segment | | Not applicable | |

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| Comments |

ERCOT, on behalf of the Real-Time Co-Optimization Task Force (RTCTF), submits these comments to Nodal Protocol Revision Request (NPRR) 1011 to reflect the consensus of RTCTF with respect to the Protocol sections listed below—i.e., as a baseline view of proposed changes in this NPRR. Please note that ERCOT is submitting these comments on behalf of RTCTF because RTCTF is not an Entity qualified to submit or comment on a Revision Request. RTCTF consensus on the Protocol sections outlined below does not preclude comments necessary to address later-discovered issues relevant to the Key Principles associated with these revisions, or other RTC Revision Requests that require alignment.

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| **Protocol Section** | **RTCTF Review Complete** |
| 8.1.1.1 | 6/29/2020 |
| 8.1.1.2 | 6/29/2020 |
| 8.1.1.2.1 | 8/12/2020 |
| 8.1.1.2.1.1 | 8/12/2020 |
| 8.1.1.2.1.2 | 8/12/2020 |
| 8.1.1.2.1.3 | 8/12/2020 |
| 8.1.1.2.1.6 | 8/12/2020 |
| 8.1.1.3 | 9/28/2020 |
| 8.1.1.3.1 | 9/28/2020 |
| 8.1.1.3.2 | 9/28/2020 |
| 8.1.1.3.3 | 9/28/2020 |
| 8.1.1.3.4 | 9/28/2020 |
| 8.1.1.4.1 | 9/28/2020 |
| 8.1.1.4.2 | 9/28/2020 |
| 8.1.1.4.3 | 9/28/2020 |
| 8.1.1.4.4 | 9/28/2020 |
| 8.1.2 | 9/28/2020 |
| 8.5.1.1 | 9/28/2020 |

Please refer to the “RTC Revision Request Mapping, Schedule, and Tracking” spreadsheet on the [RTCTF page](http://www.ercot.com/committee/rtctf) for the current schedule and status of RTCTF review on all sections for all RTC Revision Requests.

As discussed at previous PRS meetings, ERCOT requests PRS grant NPRR1011 urgent status in order to advance NPRR1011 to the December 8, 2020 Board of Directors meeting to align with ERCOT’s Passport program timeline. Comments that have been submitted to NPRR1011 (including this set of comments) have not impacted the 3/25/20 Impact Analysis for NPRR1011.

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| Revised Cover Page Language |

None

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| **Market Rules Notes** |

Please note the baseline Protocol language in the following sections has been updated to reflect the incorporation of the following NPRR(s) into the Protocols:

* NPRR989, BESTF-1 Energy Storage Resource Technical Requirements (incorporated 7/1/20)
  + Section 8.5.1.1
* NPRR1000, Elimination of Dynamically Scheduled Resources (incorporated 9/1/20)
  + Section 8.1.1.4.1

Please note that the following NPRR(s) also propose revisions to the following section(s):

* NPRR1014, BESTF-4 Energy Storage Resource Single Model
  + Section 8.1.1.2.1.1
  + Section 8.1.1.2.1.2
  + Section 8.1.1.4.1

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| Revised Proposed Protocol Language |

**8.1.1.1 Ancillary Service Qualification and Testing**

(1) Each QSE and the Resource providing Ancillary Service must meet qualification criteria to operate satisfactorily with ERCOT. ERCOT shall use the Ancillary Service qualification and testing program that is approved by TAC and included in the Operating Guides. Each QSE for the Resources that it represents may only provide Ancillary Services on those Resources for which it has met the qualification criteria.

(2) General capacity testing must be used to verify a Resource’s Net Dependable Capability. Qualification tests allow the Resource and QSE to demonstrate the minimum capabilities necessary to deploy an Ancillary Service.

(3) A Resource may be provisionally qualified for a period of 90 days and may be eligible to participate as a Resource providing Ancillary Service. Resources that have installed the appropriate equipment with verifiable testing data may be provisionally qualified as providers of Ancillary Service.

(4) A Load Resource may be provisionally qualified for a period of 90 days to participate as a Resource providing Ancillary Service, if the Load Resource is metered with an Interval Data Recorder (IDR) to ERCOT’s reasonable satisfaction. A Load Resource providing Ancillary Service in Real-Time must meet the following requirements:

(a) Electric Service Identifier (ESI ID) registration of Load Resources providing Ancillary Service by the QSE; and

(b) Load Resource telemetry is installed and tested between QSE and ERCOT.

(5) Provisional qualification as described herein may be revoked by ERCOT at any time for any non-compliance with provisional qualification requirements.

(6) For those Settlement Intervals during which a Generation Resource or Load Resource behind the Generation Resource Node is engaged in testing in accordance with this Section, the provisions of Section 6.6.5, Set Point Deviation Charge, will not apply to the Resource being tested beginning with the Settlement Interval immediately preceding the Settlement Interval in which ERCOT issues a Dispatch Instruction that begins the test and continuing until the end of the Settlement Interval in which the test completes. During the same Settlement Intervals for the testing period, the Generation Resource Energy Deployment Performance (GREDP) calculated in accordance with Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource Energy Deployment Performance, will not apply.

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| [NPRR963: Replace paragraph (6) above with the following upon system implementation:]  (6) For those Settlement Intervals during which a Generation Resource, Load Resource, or Energy Storage Resource (ESR) behind the Generation Resource Node is engaged in testing in accordance with this Section, the provisions of Section 6.6.5, Set Point Deviation Charge, will not apply to the Resource being tested beginning with the Settlement Interval immediately preceding the Settlement Interval in which ERCOT issues a Dispatch Instruction that begins the test and continuing until the end of the Settlement Interval in which the test completes. During the same Settlement Intervals for the testing period, the Generation Resource Energy Deployment Performance (GREDP) or Energy Storage Resource Energy Deployment Performance (ESREDP) calculated in accordance with Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance, will not apply. |

(7) ERCOT may reduce the amount a Resource may contribute toward Ancillary Service if it determines unsatisfactory performance of the Resource as defined in Section 8.1.1, QSE Ancillary Service Performance Standards.

(8) To maintain qualification with ERCOT to provide RRS service, each Load Resource, excluding Controllable Load Resources, will be subject to a Load interruption test at a date and time determined by ERCOT and known only to ERCOT and the affected Transmission Service Provider (TSP), to verify the ability to respond to an ERCOT Dispatch Instruction. To successfully pass this test, within ten minutes of the receipt of the ERCOT Dispatch Instruction by the Load Resource’s QSE, the Load Resource’s response shall not be less than 95% of the requested MW deployment, nor more than 150% of the lesser of the following:

(a) The Resource’s RRS award, or

(b) The requested MW deployment.

The requested MW deployment will be the sum of the Resource’s RRS award and the telemetered additional capacity between the net power consumption and the Low Power Consumption (LPC). If a Load Resource has responded to an actual ERCOT Dispatch Instruction in compliance with (a) and (b) above in the rolling 365-day period, ERCOT will use that response in lieu of a Load interruption test. If a Load Resource has not responded to an ERCOT Dispatch Instruction in compliance with (a) and (b) above, either in a deployment event or a Load interruption test, in any rolling 365-day period, it is subject to a Load interruption test by ERCOT. QSEs may request to have individual Load Resources aggregated for the purposes of Load interruption tests. All performance evaluations will apply on an individual Resource basis.

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| ***[NPRR863: Replace paragraph (8) above with the following upon system implementation:]***  (8) To maintain qualification with ERCOT to provide RRS or ECRS service, each Load Resource, excluding Controllable Load Resources, will be subject to a Load interruption test at a date and time determined by ERCOT and known only to ERCOT and the affected Transmission Service Provider (TSP), to verify the ability to respond to an ERCOT Dispatch Instruction. To successfully pass this test, within ten minutes of the receipt of the ERCOT Dispatch Instruction by the Load Resource’s QSE, the Load Resource’s response shall not be less than 95% of the requested MW deployment, nor more than 150% of the lesser of the following:  (a) The Resource’s ECRS and RRS awards, or  (b) The requested MW deployment.  The requested MW deployment will be the sum of the Resource’s ECRS and RRS awards, and the telemetered additional capacity between the net power consumption and the Low Power Consumption (LPC). If a Load Resource has responded to an actual ERCOT Dispatch Instruction in compliance with (a) and (b) above in the rolling 365-day period, ERCOT will use that response in lieu of a Load interruption test. If a Load Resource has not responded to an ERCOT Dispatch Instruction in compliance with (a) and (b) above, either in a deployment event or a Load interruption test, in any rolling 365-day period, it is subject to a Load interruption test by ERCOT. QSEs may request to have individual Load Resources aggregated for the purposes of Load interruption tests. All performance evaluations will apply on an individual Resource basis. |

(9) ERCOT may revoke the Ancillary Service qualification of any Load Resource, excluding Controllable Load Resources, for failure to comply with the required performance standards, based on the evaluation it performed under paragraph (1)(e) of Section 8.1.1.4.2, Responsive Reserve Service Energy Deployment Criteria. Specifically, if a Load Resource that is providing RRS fails to respond with at least 95% of its RRS award within ten minutes of an ERCOT Dispatch Instruction, that response shall be considered a failure. Two Load Resource performance failures, either in a deployment event or a Load interruption test, within any rolling 365-day period shall result in disqualification of that Load Resource. After six months of disqualification, the Load Resource may reapply for qualification provided it submits a corrective action plan to ERCOT that identifies actions taken to correct performance deficiencies and the disqualified Load Resource successfully passes a new Load interruption test as specified in this Section 8.1.1.1.

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| ***[NPRR863: Replace paragraph (9) above with the following upon system implementation:]***  (9) ERCOT may revoke the Ancillary Service qualification of any Load Resource, excluding Controllable Load Resources, for failure to comply with the required performance standards, based on the evaluation it performed under paragraph (5) of Section 8.1.1.4.2, Responsive Reserve Energy Deployment Criteria or under paragraph (1)(c) of Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria. Specifically, if a Load Resource that is providing RRS or ECRS fails to respond with at least 95% of its ECRS or RRS award within ten minutes of an ERCOT Dispatch Instruction, that response shall be considered a failure. Two Load Resource performance failures, either in a deployment event or a Load interruption test, within any rolling 365-day period shall result in disqualification of that Load Resource. After six months of disqualification, the Load Resource may reapply for qualification provided it submits a corrective action plan to ERCOT that identifies actions taken to correct performance deficiencies and the disqualified Load Resource successfully passes a new Load interruption test as specified in this Section 8.1.1.1. |

(10) To maintain qualification with ERCOT to provide RRS from Fast Frequency Response (FFR), each Resource will be subject to an FFR qualification test at a date and time determined by ERCOT and known only to ERCOT and the affected TSP as applicable, to verify the ability to respond to an ERCOT Dispatch Instruction. To successfully pass this test, within ten minutes of the receipt of the ERCOT Dispatch Instruction by the Resource’s QSE, the Resource’s response shall not be less than 95% of the requested MW deployment, nor more than 105% of the lesser of the following:

(a) The Resource’s RRS award; or

(b) The MW deployment.

The requested MW deployment for Resources capable of FFR will be the sum of the Resource’s RRS award and the additional capacity between the telemetered High Sustained Limit (HSL) and the telemetered Low Sustained Limit (LSL). If a Resource has responded to an actual event in compliance with items (a) and (b) above in the rolling 365-day period, ERCOT will use that response in lieu of an FFR test. If a Resource has not responded to an ERCOT Dispatch Instruction in compliance with items (a) and (b) above, in either a deployment event or an FFR test, in any rolling 365-day period, it is subject to an FFR test by ERCOT. All performance evaluations will apply on an individual Resource basis.

(11) ERCOT may revoke the Ancillary Service qualification of any Resource providing FFR if that Resource has two Resource performance failures, either in a manual deployment event or a frequency triggered event, within any rolling 365-day period. A performance failure is defined as a response less than 95% or more than 105% of the Resource’s RRS award within 15 cycles of a triggering event or within ten minutes of an ERCOT Dispatch Instruction. This shall result in disqualification of that Resource. After six months of disqualification, a Resource may reapply for qualification provided it submits a corrective action plan to ERCOT that identifies actions taken to correct performance deficiencies and the disqualified Resource successfully passes a new test as specified in Section 8.1.1.2.1.2, Responsive Reserve Qualification.

**8.1.1.2 General Capacity Testing Requirements**

(1) Within the first 15 days of each Season, each QSE shall provide ERCOT a Seasonal HSL for any Generation Resource with a capacity greater than ten MW that will be operated during that Season. ERCOT shall provide an appropriate form for QSEs to submit their Seasonal HSL data. The Seasonal HSL form shall take into account auxiliary Load and gross and net real power capability of the Generation Resource. Each QSE shall update its COP and telemetry, as necessary, to reflect the HSL of each of its Generation Resources in a given operating interval as well as other operational limitations. The HSL shown in the COP for a Generation Resource may not be ramp rate-limited while the Real-Time telemetered value of HSL for the Generation Resource may be ramp rate-limited by the QSE representing the Generation Resource in order for the Generation Resource to meet its HSL using the testing process described in paragraph (2) below.

(2) To verify that the HSL reported by telemetry is achievable, ERCOT may, at its discretion, conduct an unannounced Generation Resource test. At a time determined solely by ERCOT, ERCOT will issue a Verbal Dispatch Instruction (VDI) to the QSE to operate the designated Generation Resource at its HSL as shown in the QSE’s telemetry at the time the test is initiated. Immediately upon receiving the VDI the QSE shall telemeter Resource Status as “ONTEST.” The QSE shall not be required to start the designated Generation Resource if it is not already On-Line when ERCOT announces its intent to test the Resource. If the designated Generation Resource is operating at its LSL when ERCOT sends the VDI to begin the test, the QSE shall have up to 60 minutes to allow the Resource to reach 90% of its HSL as shown by telemetry and up to an additional 20 minutes for the Resource to reach the HSL shown by telemetry at the time the test is initiated. This time requirement does not apply to nuclear-fueled Generation Resources. If the designated Generation Resource is operating between its LSL and 50% of its HSL shown by telemetry when ERCOT begins the test, the QSE shall have 60 minutes for the Resource to reach its HSL. If the Resource is operating at or above 50% of its HSL shown by telemetry when ERCOT begins the test, the QSE shall have 30 minutes for the Resource to reach its HSL. Once the designated Generation Resource reaches its HSL, the QSE shall hold it at that output level for a minimum of 30 minutes. The HSL for the designated Generation Resource shall be determined based on the Real-Time averaged MW telemetered by the Resource during the 30 minutes of constant output. After each test, the QSE representing the Generation Resource will complete and submit the test form using the Net Dependable Capability and Reactive Capability (NDCRC) application located on the Market Information System (MIS) Secure Area within two Business Days.

(3) ERCOT may test multiple Generation Resources within a single QSE within a single 24-hour period. However, in no case shall ERCOT test more than two Generation Resources within one QSE simultaneously. All Resources On-Line in a Combined-Cycle Configuration will be measured on an aggregate capacity basis. All QSEs associated with a jointly owned unit will be tested simultaneously. Hydro, wind, and PhotoVoltaic (PV) generation will be excluded from unannounced generation capacity testing. ERCOT shall not perform an unannounced Generation Resource test during a Watch or Energy Emergency Alert (EEA) event. If an unannounced Generation Resource test is underway when a Watch or EEA event commences, ERCOT may cancel the test.

(4) Should the designated Generation Resource fail to reach its HSL shown in its telemetry within the time frame set forth herein, the Real-Time averaged MW telemetered during the test shall be the basis for the new HSL for the designated Generation Resource for that Season. The QSE shall have the opportunity to request another test as quickly as possible (at a time determined by ERCOT) and may retest up to two times per month. The QSE may also demonstrate an increased value of HSL by operating the Generation Resource at an Output Schedule for at least 30 minutes. In order to raise an output schedule above the Seasonal HSL, the QSE may set the Resource telemetered HSL equal to its output temporarily for the purposes of the demonstration tests. After either a retest or a demonstration test, the MW capability of the Generation Resource based on the average of the MW production telemetered during the test shall be the basis for the new HSL for the designated Generation Resource for that Season. Any requested retest must take place within three Business Days after the request for retest.

(5) The telemetered value of HSL for the Generation Resource shall only be used for testing purposes as described in this Section or for system reliability calculations.

(6) A Resource Entity owning a hydro unit operating in the synchronous condenser fast response mode to provide hydro RRS shall evaluate the maximum capability of the Resource each Season.

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| ***[NPRR863: Replace paragraph (6) above with the following upon system implementation:]***  (6) A Resource Entity owning a Generation Resource operating in the synchronous condenser fast response mode to provide RRS or ECRS shall evaluate the maximum capability of the Resource each Season. |

(7) ERCOT shall maintain historical records of unannounced Generation Resource test results, using the information contained therein to adjust the Reserve Discount Factor (RDF) subject to the approval of the appropriate TAC subcommittee. ERCOT shall report to the Reliability and Operations Subcommittee (ROS) annually or as requested by ROS the aggregated results of such unannounced testing (excluding retests), including, but not limited to, the number and total capacity of Resources tested, the percentage of Resources that met or exceeded their HSL reported by telemetry, the percentage that failed to meet their HSL reported by telemetry, and the total MW capacity shortfall of those Resources that failed to meet their HSL reported by telemetry.

(8) QSEs who receive a VDI to operate the designated Generation Resource for an unannounced Generation Resource test may be considered for additional compensation under Section 6.6.9, Emergency Operations Settlement. Any unannounced Generation Resource test VDI that ERCOT issues as a result of a QSE-requested retest will not be considered for additional compensation under Section 6.6.9.

(9) All unannounced Generation Resource test VDIs will be considered as an instructed deviation for compliance purposes.

(10) Before the start of each Season, a QSE shall provide ERCOT a list identifying each Controllable Load Resource that is expected to operate in a Season as a provider of Ancillary Service. Prior to the beginning of each Season, QSEs shall identify the Controllable Load Resources to be tested during the Season and the specific week of the test if known. Any Controllable Load Resource for which the QSE desires qualification to provide Ancillary Services shall have its Net Dependable Capability verified prior to providing Ancillary Services.

(11) ERCOT shall verify the telemetry attributes of each qualified Load Resource as follows:

(a) ERCOT shall annually verify the telemetry attributes of each Load Resource providing RRS using a high-set under-frequency relay. In addition, once every two years, any Load Resource qualified to provide RRS using a high-set under-frequency relay shall test the correct operation of the under-frequency relay or the output from the solid-state switch, whichever applies. However, if a Load Resource’s performance has been verified through response to an actual event, the data from the event can be used to meet the annual telemetry verification requirement for that year and the biennial relay-testing requirement.

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| ***[NPRR863: Replace paragraph (a) above with the following upon system implementation:]***  (a) ERCOT shall annually verify the telemetry attributes of each Load Resource providing RRS or ECRS using a high-set under-frequency relay. In addition, once every two years, any Load Resource qualified to provide RRS or ECRS using a high-set under-frequency relay shall test the correct operation of the under-frequency relay or the output from the solid-state switch, whichever applies. However, if a Load Resource’s performance has been verified through response to an actual event, the data from the event can be used to meet the annual telemetry verification requirement for that year and the biennial relay-testing requirement. |

(b) ERCOT shall periodically validate the telemetry attributes of each Controllable Load Resource. In the case of an Aggregate Load Resource (ALR), ERCOT will follow the validation procedures described in the document titled “Requirements for Aggregate Load Resource Participation in the ERCOT Markets.” If a QSE fails to meet its telemetry validation requirements, ERCOT may suspend the QSE and/or the Controllable Load Resource from participation in the applicable services or markets. If disqualified pursuant to this paragraph, a QSE or Controllable Load Resource may reestablish its qualification by submitting a corrective action plan to ERCOT that identifies actions taken to correct performance deficiencies and by successfully passing a new ERCOT telemetry validation test.

(12) Telemetry values of a Load Resource may be adjusted to reflect Distribution Losses, based on the ERCOT-forecasted Distribution Loss Factors (DLFs). Load Resources may be adjusted for Distribution Losses using the same distribution loss code as assigned to the ESI ID.

(13) A specific Load Resource to be used for the first time to provide Regulation, RRS, Non-Spin or energy by following Security-Constrained Economic Dispatch (SCED) Base Points, must be tested to ERCOT’s reasonable satisfaction using actual Demand response as part of its qualification. The test must take place at a time mutually selected by the QSE representing the Load Resource and ERCOT. ERCOT shall make available its standard test document for Load Resource qualification required under this Section on the MIS Public Area.

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| ***[NPRR863: Replace paragraph (13) above with the following upon system implementation:]***  (13) A specific Load Resource to be used for the first time to provide Regulation, RRS, ECRS, Non-Spin or energy by following Security-Constrained Economic Dispatch (SCED) Base Points, must be tested to ERCOT’s reasonable satisfaction using actual Demand response as part of its qualification. The test must take place at a time mutually selected by the QSE representing the Load Resource and ERCOT. ERCOT shall make available its standard test document for Load Resource qualification required under this Section on the MIS Public Area. |

(14) Any changes to a Load Resource including changes to its capability to provide Ancillary Service requires updates by the Load Resource to the registration information detailing the change. For Non-Opt-In Entities (NOIEs) representing specific Load Resources that are located behind the NOIE Settlement Metering points, the NOIE shall provide an alternative unique descriptor of the qualified Load Resource for ERCOT’s records.

(15) Qualification of a Resource, including a Load Resource, remains valid for that Resource in the event of a change of QSE for the Resource, provided that the new QSE demonstrates to ERCOT’s reasonable satisfaction that the new QSE has adequate communications and control capability for the Resource.

(16) For purposes of qualifying Quick Start Generation Resources (QSGRs), ERCOT shall issue a unit-specific VDI for the MW amount that the QSE is requesting to qualify its QSGR to provide. The QSE shall telemeter an ONTEST Resource Status. The QSGR will only be qualified to provide an amount not to exceed the observed output at the end of a ten-minute test period.

(17) ERCOT may revoke the QSGR qualification of any QSGR for failure to comply with the following performance standard:

(a) A QSGR, available for deployment by SCED, is deemed to have failed to start for the purpose of this performance measure if the QSGR fails to achieve at least 90% of the minimum ERCOT SCED Base Point, including zero Base Points, within ten minutes of the initial ERCOT SCED Base Point that dispatched the QSGR above zero MW output.

(b) ERCOT may revoke a QSGR’s qualification if within a rolling 90-day period the number of QSGR failures to start, as determined by paragraph (a) above, exceeds the higher of three failures or 10% of the number of quick start mode startups made in response to SCED deployments.

(18) If disqualified pursuant to paragraph (17) above, a QSGR may reestablish its QSGR qualification by submitting a corrective action plan to ERCOT that identifies actions taken to correct performance deficiencies and by successfully passing a new ERCOT QSGR test.

**8.1.1.2.1 Ancillary Service Technical Requirements and Qualification Criteria and Test Methods**

(1) A QSE and the Resource that it represents must be qualified to provide Ancillary Services. ERCOT shall develop and operate a qualification and testing program that meets the requirements of this Section for each Ancillary Service. Prior to the Texas Nodal Market Implementation Date, a QSE and the Resources that it represents that are qualified to provide an Ancillary Service in accordance with an effective Protocol, are deemed to be qualified to provide Ancillary Services after the Texas Nodal Market Implementation Date, provided that the QSE and the Resource have been certified capable of providing an Ancillary Service by a responsible Market Participant, as determined by ERCOT. Resources that are thus certified to provide Ancillary Services and that have a performance history determined in accordance with this Section, and that fail to meet the performance metrics described in this Section on the Texas Nodal Market Implementation Date, or thereafter, will be required to qualify in accordance with this Section before providing the Ancillary Service.

(2) A QSE and the Resource that it represents must be qualified in accordance with this Section as an Ancillary Service and reserve provider and at ERCOT’s discretion will be required to re-qualify to provide Ancillary Service or reserve if acceptable performance as determined in accordance with this Section has not been maintained.

(3) The qualification process for a Resource to provide Ancillary Service will determine whether the Resource is capable of providing Ancillary Service and the maximum quantity of Ancillary Service that the Resource is qualified to provide. ERCOT may update the maximum quantity of RRS a Resource is qualified to provide based on actual performance of the Resource in accordance with Section 8.1.1.2.1.2, Responsive Reserve Service Qualification.

**8.1.1.2.1.1 Regulation Service Qualification**

(1) A QSE control system must be capable of receiving Regulation Up Service (Reg-Up) and Regulation Down Service (Reg-Down) control signals from ERCOT’s Load Frequency Control (LFC) system, and of directing its Resources to respond to the control signals, in an upward and downward direction to balance Real-Time Demand and Resources. A QSE representing Resources qualified to provide Reg-Up or Reg-Down shall provide communications equipment to receive telemetered control deployments of power from ERCOT.

(2) A QSE shall demonstrate to ERCOT that they have the ability to switch control to constant frequency operation as specified in the Operating Guides. ERCOT’s direction to the QSE to operate on constant frequency will be considered a Dispatch Instruction.

(3) A QSE providing Reg-Up or Reg-Down shall provide ERCOT with the data requirements of Section 6.5.5.2, Operational Data Requirements. Resources providing Reg-Up or Reg-Down must be capable of delivering the full amount of regulating capacity offered to ERCOT within five minutes.

(4) A Reg-Up and Reg-Down qualification test for each Resource is conducted during a continuous 60-minute period agreed on in advance by the QSE and ERCOT. QSEs may qualify a Resource to provide Reg-Up or Reg-Down, or both, in separate testing. ERCOT shall administer the following test requirements:

(a) ERCOT shall confirm the date and time of the test with the QSE.

(b) For the 60-minute duration of the test, when market and reliability conditions allow, the ERCOT Control Area Operator shall send a random sequence of increasing ramp, hold, and decreasing ramp control signals to the QSE for a specific Resource. ERCOT shall maintain a duration interval, for each increasing ramp, hold, or decreasing ramp sequence, of no less than two minutes. The control signals may not request Resource performance beyond the HSL, LSL, and ramp rate limit agreed on prior to the test. During the test, ERCOT shall structure the test sequence such that at least one five-minute test interval is used to test the Resource’s ability to achieve the entire amount of Reg-Up or Reg-Down requested for qualification.

(c) ERCOT shall measure and record the average real power output for each minute of the Resource(s) being tested represented by the QSE. During at least one five minute duration interval selected to evaluate each of the Reg-Up and Reg-Down amounts being tested, the Generation/Controllable Load Resource Energy Deployment Performance (GREDP/CLREDP) calculated in accordance with Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource Energy Deployment Performance, over the entire five minute interval must be less than or equal to 3.5%. Additionally, in all other test sequence intervals, the Resource’s measured GREDP/CLREDP must be less than or equal to 5% as calculated for the entire duration of each test interval.

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| [NPRR963: Replace paragraph (c) above with the following upon system implementation:]  (c) ERCOT shall measure and record the average real power output for each minute of the Resource(s) being tested represented by the QSE. During at least one five minute duration interval selected to evaluate each of the Reg-Up and Reg-Down amounts being tested, the Generation/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance (GREDP/CLREDP/ESREDP) calculated in accordance with Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance, over the entire five minute interval must be less than or equal to 3.5%. Additionally, in all other test sequence intervals, the Resource’s measured GREDP/CLREDP/ESREDP must be less than or equal to 5% as calculated for the entire duration of each test interval. |

(d) On successful demonstration of the above test criteria, ERCOT shall qualify that the Resource is capable of providing Regulation Service and shall provide a copy of the certificate to the QSE and the Resource.

(5) The maximum quantity of Reg-Up or Reg-Down that an individual Resource is qualified to provide is limited to the amount of Ancillary Service that can be sustained by the Resource for at least 15 minutes.

**8.1.1.2.1.2 Responsive Reserve Service Qualification**

(1) RRS may be provided by:

(a) Unloaded Generation Resources that are On-Line;

(b) Load Resources controlled by high-set under-frequency relays;

(c) Hydro RRS; or

(d) Controllable Load Resources.

(2) The amount of RRS provided by individual Generation Resources and Controllable Load Resources is specified in the Operating Guides. Each Resource providing RRS must be On-Line and capable of ramping to the Resource’s RRS award within ten minutes of the notice to deploy RRS and must be immediately responsive to system frequency. The amount of RRS on a Generation Resource may be further limited by requirements of the Operating Guides.

(3) A QSE’s Load Resource must be loaded and capable of unloading the awarded amount of RRS within ten minutes of instruction by ERCOT and must either be immediately responsive to system frequency or be interrupted by action of under-frequency relays with settings as specified by the Operating Guides.

(4) Any QSE providing RRS shall provide communications equipment to receive ERCOT telemetered control deployments of RRS.

(5) Generation Resources offering to provide RRS shall have their governors in service.

(6) Load Resources on high-set under-frequency relays providing RRS must provide a telemetered output signal, including breaker status and status of the under-frequency relay.

(7) Each QSE shall ensure that each Resource is able to meet the Resource’s obligations to provide the Ancillary Service award. Each Generation Resource and Load Resource providing RRS must meet additional technical requirements specified in this Section.

(8) A qualification test for each Resource to provide RRS is conducted during a continuous eight-hour period agreed to by the QSE and ERCOT. ERCOT shall confirm the date and time of the test with the QSE. ERCOT shall administer the following test requirements:

(a) At any time during the window (selected by ERCOT when market and reliability conditions allow and not previously disclosed to the QSE), ERCOT shall notify the QSE it is to provide an amount of RRS from its Resource to be qualified equal to the amount that the QSE is requesting qualification. The QSE shall acknowledge the start of the test.

(b) For Generation Resources desiring qualification to provide RRS, ERCOT shall send a signal to the Resource’s QSE to deploy RRS, indicating the MW amount. ERCOT shall measure the test Resource’s response as described under Section 8.1.1.4.2, Responsive Reserve Service Energy Deployment Criteria. ERCOT shall evaluate the response of the Generation Resource given the current operating conditions of the system and determine the Resource’s qualification to provide RRS.

(c) For Controllable Load Resources desiring qualification to provide RRS, ERCOT shall send a signal to the Resource’s QSE to deploy RRS, indicating the MW amount. ERCOT shall measure the test Resource’s response as described under Section 8.1.1.4.2. ERCOT shall evaluate the response of the Controllable Load Resource given the current operating conditions of the system and determine the Controllable Load Resource’s qualification to provide RRS.

(d) For Load Resources, excluding Controllable Load Resources, desiring qualification to provide RRS, ERCOT shall deploy RRS, indicating the MW amount. ERCOT shall measure the test Resource’s response as described under Section 8.1.1.4.2.

(e) On successful demonstration of all test criteria, ERCOT shall qualify that the Resource is capable of providing RRS and shall provide a copy of the certificate to the QSE and the Resource Entity.

(9) For Resources providing RRS and available for dispatch by SCED, the maximum quantity of RRS that a Resource is qualified to provide is limited to the amount of RRS that can be sustained by the Resource for at least 15 minutes. For all other Resources, the maximum quantity of RRS that a Resource is qualified to provide is limited to the amount of RRS that can be sustained by the Resource for at least one hour.

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| ***[NPRR863: Replace Section 8.1.1.2.1.2 above with the following upon system implementation:]***  **8.1.1.2.1.2 Responsive Reserve Qualification**  (1) RRS may be provided by:  (a) On-Line Generation Resource capacity;  (b) Resources capable of providing FFR;  (c) Generation Resources operating in the synchronous condenser fast-response mode; and  (d) Load Resources controlled by high-set under-frequency relays.  (2) The amount of RRS provided by individual Generation Resources is limited by the ERCOT-calculated maximum MW amount of RRS for the Generation Resource subject to its verified droop performance as described in the Nodal Operating Guide. The default value for any newly qualified Generation Resource shall be 20% of its HSL. A Private Use Network with a registered Resource may use the gross HSL for qualification and establishing a limit on the amount of RRS capacity that the Resource within the Private Use Network can provide.  (3) Any QSE representing Resources qualified to provide RRS shall provide communications equipment to provide ERCOT with telemetry for the output of the Resource.  (4) Resources capable of FFR providing RRS must provide a telemetered output signal, including breaker status and status of the frequency detection device.  (5) Each QSE shall ensure that each Resource is able to meet the Resource’s obligations to provide the RRS award. Each Resource providing RRS must meet additional technical requirements specified in this Section.  (6) Generation Resources offering to provide RRS shall have their Governors in service.  (7) Generation Resources and Resources capable of FFR providing RRS shall have a Governor droop setting that is no greater than 5.0%.  (8) Resources may be provisionally qualified by ERCOT to provide RRS for 90 days. Within the 90-day provisional window, a Resource must successfully complete one of the Governor tests identified in the Nodal Operating Guide Section 8, Attachment C, Turbine Governor Speed Tests, before being declared fully qualified to provide RRS.  (9) For Resources providing RRS and available for dispatch by SCED, the maximum quantity of RRS that a Resource is qualified to provide is limited to the amount of RRS that can be sustained by the Resource for at least 15 minutes. For all other Resources excluding non-Controllable Load Resources providing FFR, the maximum quantity of RRS that a Resource is qualified to provide is limited to the amount of RRS that can be sustained by the Resource for at least one hour. The maximum quantity of FFR that any non-Controllable Load Resource qualified to provide FFR is limited to the amount of FFR that can be sustained by the Resource for at least 15 minutes. |

**8.1.1.2.1.3 Non-Spinning Reserve Qualification**

(1) Each Off-Line Resource being offered in to provide Non-Spin must be capable of being synchronized and ramped to its Ancillary Service award for Non-Spin within 30 minutes. Non-Spin may be provided from Generation Resource capacity that can ramp within 30 minutes or Load Resources capable of unloading within 30 minutes. Non-Spin may only be provided from capacity that is not fulfilling any other energy or capacity commitment.

(2) All Resources qualified to participate in SCED are also qualified to provide Non-Spin when the Resource is On-Line. The amount of Non-Spin for which the Resource is qualified when On-Line is limited to the amount of capacity that can be ramped or unloaded within 30 minutes.

(3) A Controllable Load Resource offering to provide Non-Spin must be qualified to participate in SCED and must provide a telemetered output signal, including breaker status.

(4) Each Resource providing Non-Spin when Off-Line must meet additional technical requirements specified in this Section.

(5) QSEs using a Controllable Load Resource to provide Non-Spin must be capable of responding to ERCOT Dispatch Instructions in a similar manner to QSEs using Generation Resource to provide Non-Spin.

(6) Each QSE shall ensure that each Resource is able to meet the Resource’s obligations to provide the Ancillary Service award.

(7) For any Resource requesting qualification for providing Non-Spin when Off-Line, a qualification test for each Resource to provide Non-Spin is conducted during a continuous eight hour period agreed to by the QSE and ERCOT. ERCOT shall confirm the date and time of the test with the QSE. ERCOT shall administer the following test requirements.

(a) At any time during the window (selected by ERCOT when market and reliability conditions allow and not previously disclosed to the QSE), ERCOT shall notify the QSE by using the messaging system and requesting that the QSE provide an amount of Non-Spin from each Resource equal to the amount for which the QSE is requesting qualification. The QSE shall acknowledge the start of the test.

(b) For Off-Line Resources during the test window, ERCOT shall send a message to the QSE representing a Resource to deploy Non-Spin. ERCOT shall measure the test Resource’s response as described under Section 8.1.1.4.3, Non-Spinning Reserve Service Energy Deployment Criteria. ERCOT shall evaluate the response of the Resource given the current operating conditions of the system and determine the Resource’s qualification to provide Non-Spin.

(8) The maximum quantity of Non-Spin that an individual Resource is qualified to provide is limited to the amount of Non-Spin that can be sustained by the Resource for at least one hour.

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| ***[NPRR863: Insert Section 8.1.1.2.1.6 below upon system implementation:]***  **8.1.1.2.1.6 ERCOT Contingency Reserve Service Qualification**  (1) ECRS may be provided by:  (a) Unloaded Generation Resources that are On-Line;  (b) Quick Start Generation Resources (QSGRs);  (c) Load Resources that may or may not be controlled by high-set under-frequency relays;  (d) Generation Resources operating in the synchronous condenser fast-response mode; or  (e) Controllable Load Resources.  (2) All Resources qualified to participate in SCED or qualified to telemeter a Resource Status of ONSC are also qualified to provide ECRS when the Resource is On-Line. The amount of ECRS for which the Resource is qualified when On-Line will be limited to the amount of capacity that can be ramped or unloaded within 10 minutes. Off-Line ECRS can only be provided by qualified QSGRs.  (3) The amount of ECRS provided by individual Generation Resources and Load Resources is limited to ten times its telemetered emergency ramp rate. Each Resource providing ECRS must be capable of ramping the Resource’s Ancillary Service award for ECRS within ten minutes of the notice to deploy ECRS, and must be able to maintain the awarded level of deployment for at least one hour. The amount of ECRS on a Generation Resource may be further limited by requirements of the Operating Guides.  (4) A Load Resource must be loaded and capable of unloading the awarded amount of ECRS within ten minutes of instruction by ERCOT and must either be immediately responsive to system frequency or be interrupted by action of under-frequency relays with settings as specified by the Operating Guides.  (5) Any QSE providing ECRS shall provide communications equipment to receive ERCOT telemetered control deployments of ECRS.  (6) Load Resources providing ECRS must provide a telemetered output signal, including breaker status and status of the under-frequency relay, if applicable.  (7) Each QSE shall ensure that each Resource is able to meet the Resource’s obligations to provide the Ancillary Service award. Each Generation Resource and Load Resource providing ECRS when Off-Line as a QSGR with an OFFQS Resource Status, or when not qualified to participate in SCED, must meet additional technical requirements specified in this Section.  (8) A qualification test for each Resource to provide ECRS when Off-Line as a QSGR with an OFFQS Resource Status or as a Load Resource, excluding Controllable Load Resources, is conducted during a continuous eight-hour period agreed to by the QSE and ERCOT. ERCOT shall confirm the date and time of the test with the QSE. ERCOT shall administer the following test requirements:  (a) At any time during the window (selected by ERCOT when market and reliability conditions allow and not previously disclosed to the QSE), ERCOT shall notify the QSE it is to provide an amount of ECRS from its Resource to be qualified equal to the amount that the QSE is requesting qualification. The QSE shall acknowledge the start of the test.  (b) Generation Resources desiring qualification to provide ECRS when Off-Line must meet the QSGR qualification criteria outlined under section 8.1.1.2, General Capacity Testing Requirements. ERCOT shall measure the test Resource’s response as described under Section 8.1.1.2, General Capacity Testing Requirements, for QSGR. ERCOT shall evaluate the response of the Generation Resource given the current operating conditions of the system and determine the Resource’s qualification to provide ECRS.  (c) For Load Resources, excluding Controllable Load Resources, desiring qualification to provide ECRS, ERCOT shall deploy ECRS, indicating the MW amount. ERCOT shall measure the test Resource’s response as described under Section 8.1.1.4.4.  (d) On successful demonstration of all test criteria, ERCOT shall qualify that the Resource is capable of providing ECRS and shall provide a copy of the certificate to the QSE and the Resource Entity. |

**8.1.1.3 Ancillary Service Capacity Compliance Criteria**

(1) ERCOT shall provide each QSE representing Resources a capacity summary containing as a minimum the same general information required in Section 6.5.7.5, Ancillary Services Capacity Monitor, except specific to only the QSE. The summary shall be updated with calculations every ten seconds by ERCOT and then provided to the QSE every five minutes using the MIS Certified Area

**8.1.1.3.1 Regulation Service Capacity Monitoring Criteria**

(1) ERCOT shall continuously monitor the capacity of each Resource to provide Reg-Up and Reg-Down. When determining this available capacity, ERCOT shall consider for each Resource the Resource Status, the actual generation or Load, the Ancillary Service award for Reg-Up and Reg-Down, the HSL, the LSL, ramp rates, and the Resource’s qualification to provide Reg-Up and Reg-Down.

(2) For the Reg-Up and Reg-Down capabilitity provided for a Resource to ERCOT by the Resource’s QSE, the amount of Reg-Up or Reg-Down reflected in that capability must be limited to the amount of Reg-Up or Reg-Down that can be sustained by the Resource for at least 15 minutes.

**8.1.1.3.2 Responsive Reserve Capacity Monitoring Criteria**

(1) ERCOT shall continuously monitor the capacity of each Resource to provide RRS. ERCOT shall consider for each Resource the Resource Status, actual generation or Load, the Ancillary Service award for RRS, the HSL, the LSL, any other Resource-specific RRS capabilities telemetered by the QSE, and the Resource’s qualification to provide RRS.

(2) For Load Resources, excluding Controllable Load Resources, that have an RRS award, the amount of RRS capacity provided must be measured as the Load Resource’s average Load level in the last five minutes.

(3) A Resource that is capable of providing RRS and that has a Resource Status code of ONSC and an RRS award is considered to be providing frequency responsive capability to the extent that it is not using that capacity to provide energy or other Ancillary Services.

(4) For Resources that are providing RRS and are available for Dispatch by SCED, for the RRS capabilitity provided for a Resource to ERCOT by the Resource’s QSE, the amount of RRS reflected in that capability must be limited to the amount of RRS that can be sustained by the Resource for at least 15 minutes. For all other Resource excluding non-Controllable Load Resources provding FFR, for the RRS capabilitity provided for a Resource to ERCOT by the Resource’s QSE, the amount of RRS reflected in that capability must be limited to the amount of RRS that can be sustained by the Resource for at least one hour. Any non-Controllable Load Resources qualified to provide FFR, for the FFR capabilitity provided for a Resource to ERCOT by the Resource’s QSE, the amount of FFR reflected in that capability must be limited to the amount of FFR that can be sustained by the Resource for at least 15 minutes.

**8.1.1.3.3 Non-Spinning Reserve Capacity Monitoring Criteria**

(1) ERCOT shall continuously monitor the capacity of each Resource to provide Non-Spin. ERCOT shall consider for each Resource the Resource Status, the actual generation or Load, the Ancillary Service award for Non-Spin, the HSL/Maximum Power Consumption (MPC), the LSL/Low Power Consumption (LPC), ramp rates, and the Resource’s qualification to provide Non-Spin. ERCOT shall also monitor Non-Spin available from and awarded to qualified Resources with an OFF status.

(2) For the Non-Spin capabilitity provided for a Resource to ERCOT by the Resource’s QSE, the amount of Non-Spin reflected in that capability must be limited to the amount of Non-Spin that can be sustained by the Resource for at least one hour.

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| ***[NPRR863: Insert Section 8.1.1.3.4 below upon system implementation:]***  **8.1.1.3.4 ERCOT Contingency Reserve Service Capacity Monitoring Criteria**  (1) ERCOT shall continuously monitor the capacity of each Resource to provide ECRS. ERCOT shall consider for each Resource the Resource Status, the On-Line versus Off-Line status, actual generation or Load, the Ancillary Service award for ECRS, the HSL, the LSL, ramp rates, relay status, and the Resource’s qualification to provide ECRS.  (2) For the ECRS capabilitity provided for a Resource to ERCOT by the Resource’s QSE, the amount of ECRS reflected in that capability must be limited to the amount of ECRS that can be sustained by the Resource for at least one hour.  (3) For Load Resources, excluding Controllable Load Resources, that have an ECRS award, the amount of ECRS capacity provided must be measured as the Load Resource’s average Load level in the last five minutes.  (4) A Resource that is capable of providing ECRS and that has a Resource Status code of ONSC and an ECRS award is considered to be providing capability to the extent that it is not using that capacity to provide energy or other Ancillary Services. |

**8.1.1.4.1 Regulation Service and Generation Resource/Controllable Load Resource Energy Deployment Performance**

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| [NPRR963: Replace the title for Section 8.1.1.4.1 above with the following upon system implementation:]  **8.1.1.4.1 Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance** |

(1) For those Resources that do not have a Resource Status of ONDSR or Intermittent Renewable Resource (IRR) Groups with no member IRR having a status of ONDSR, ERCOT shall compute the GREDP for each Generation Resource that is On-Line and released to SCED for Base Point Dispatch Instructions. The GREDP is calculated for each five-minute clock interval as a percentage and in MWs for those Resources with a Resource Status that is not ONDSR as follows:

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| [NPRR963: Replace paragraph (2) above with the following upon system implementation:]  (2) For those Resources that do not have a Resource Status of ONDSR and are not part of an ESR, or Intermittent Renewable Resource (IRR) Groups with no member IRR having a status of ONDSR, ERCOT shall compute the GREDP for each Generation Resource that is On-Line and released to SCED for Base Point Dispatch Instructions. The GREDP is calculated for each five-minute clock interval as a percentage and in MWs for those Resources with a Resource Status that is not ONDSR as follows: |

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| [NPRR1000: Replace paragraph (2) above with the following upon system implementation:]  (2) For those Resources that are not part of an ESR, ERCOT shall compute the GREDP for each Generation Resource that is On-Line and released to SCED for Base Point Dispatch Instructions. The GREDP is calculated for each five-minute clock interval as a percentage and in MWs as follows: |

**GREDP (%) = ABS[((ATG – AEPFR)/(ASP)) – 1.0] \* 100**

**GREDP (MW) = ABS(ATG – AEPFR –ASP)**

Where:

ATG = Average Telemetered Generation = the average telemetered generation of the Generation Resource or for the aggregate of the IRRs within a IRR Group for the five-minute clock interval

∆frequency is actual frequency minus 60 Hz

EPFR = Estimated Primary Frequency Response (MW) = if │∆frequency│≤ Governor Dead-Band then EPFR = zero, if not then if ∆frequency > zero, EPFR = (∆frequency - Governor Dead-Band)/((droop value \* 60) – Governor Dead-Band) \* HSL \* -1, if not then if ∆frequency < zero, EPFR = (∆frequency + Governor Dead-Band)/((droop value \* 60) – Governor Dead-Band) \* HSL \* -1

AEPFR = Average Estimated Primary Frequency Response = the Estimated Primary Frequency Response (MW) will be calculated every four seconds using a Resource specific droop value where 5% droop = 0.05 the Governor Dead-Band (Hz) and Resource HSL (MW) provided by the Resource Entity, and the frequency deviation (Hz) from 60 Hz and averaged for the five-minute clock interval. For Combined Cycle Generation Resources with Non-Frequency Responsive Capacity (NFRC), the HSL to calculate the EPFR will be based on the Resource’s high limit of the capacity that is frequency responsive. For Combined Cycle Generation Resources, 5.78% Governor droop shall be used. The Resource-specific calculations will be aggregated for IRR Groups.

ASP = Average Set Point = the time-weighted average of the Resources Updated Desired Set Point (UDSP) for the five-minute clock interval (2) For all of a QSE’s Resources that have a Resource Status of ONDSR (“Dynamically Scheduled Resource (DSR) Portfolio”), ERCOT shall calculate an aggregate GREDP as a percentage and in MWs for those Resources as follows:

**GREDP (%) = ABS[(∑*DSR* ATG – ∑*DSR*DSPOS + Intra-QSE Purchase – Intra-QSE Sale – ARRDDSRLR – ANSDDSRLR – ∑*DSR* AEPFR) / (ATDSRL) – 1.0] \* 100**

**GREDP (MW) = ABS(∑*DSR*ATG – ∑*DSR* DSPOS – ATDSRL– ARRDDSRLR – ANSDDSRLR + Intra-QSE Purchase - Intra-QSE Sale – ∑*DSR* AEPFR)**

Where:

∑*DSR* ATG = Sum of Average Telemetered Generation for all Resources with a Resource Status of ONDSR or ONDSRREG of the QSE for the five-minute clock interval

ATDSRL = Average Telemetered DSR Load = the average telemetered DSR Load for the QSE for the five-minute clock interval

Intra-QSE Purchase = Energy Trade where the QSE is both the buyer and seller with the flag set to “Purchase”

Intra-QSE Sale = Energy Trade where the QSE is both the buyer and seller with the flag set to “Sale”

∑*DSR*AEPFR = Sum of Average Estimated Primary Frequency Response for all Resources with a Resource Status of ONDSR of the QSE for the five-minute clock interval

∑*DSR*DSPOS = the time-weighted average of UDSP minus Output Schedule for all Resources with a Resource Status of ONDSR of the QSE for the five-minute clock interval.

ARRDDSRLR = Average Responsive Reserve Deployment DSR Load Resource = the average RRS energy deployment for the five-minute clock interval from Load Resources that are part of the DSR Load

ANSDDSRLR = Average Non-Spin Deployment DSR Load Resource = the average Non-Spin energy deployment for the five-minute clock interval from Load Resources that are part of the DSR Load

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| ***[NPRR863: Replace paragraph (2) above with the following upon system implementation:]***  (2) For all of a QSE’s Resources that have a Resource Status of ONDSR (“Dynamically Scheduled Resource (DSR) Portfolio”), ERCOT shall calculate an aggregate GREDP as a percentage and in MWs for those Resources as follows:  **GREDP (%) = ABS[(∑*DSR* ATG – ∑*DSR*DSPOS + Intra-QSE Purchase – Intra-QSE Sale – ARRDDSRLR - AECRDDSRLR – ANSDDSRLR – ∑*DSR* AEPFR) / (ATDSRL) – 1.0] \* 100**  **GREDP (MW) = ABS(∑*DSR*ATG – ∑*DSR* DSPOS – ATDSRL– ARRDDSRLR - AECRDDSRLR – ANSDDSRLR + Intra-QSE Purchase - Intra-QSE Sale – ∑*DSR* AEPFR)**  Where:  ∑*DSR* ATG = Sum of Average Telemetered Generation for all Resources with a Resource Status of ONDSR of the QSE for the five-minute clock interval  ATDSRL = Average Telemetered DSR Load = the average telemetered DSR Load for the QSE for the five-minute clock interval  Intra-QSE Purchase = Energy Trade where the QSE is both the buyer and seller with the flag set to “Purchase”  Intra-QSE Sale = Energy Trade where the QSE is both the buyer and seller with the flag set to “Sale”  ∑*DSR*AEPFR = Sum of Average Estimated Primary Frequency Response for all Resources with a Resource Status of ONDSR of the QSE for the five-minute clock interval  ∑*DSR*DSPOS = the time-weighted average of UDSP minus Output Schedule for all Resources with a Resource Status of ONDSR of the QSE for the five-minute clock interval.  ARRDDSRLR = Average Responsive Reserve Deployment DSR Load Resource = the average RRS energy deployment for the five-minute clock interval from Load Resources that are part of the DSR Load  AECRDDSRLR = Average ERCOT Contingency Response Deployment DSR Load Resource = the average ECRS energy deployment for the five-minute clock interval from Load Resources that are part of the DSR Load  ANSDDSRLR = Average Non-Spin Deployment DSR Load Resource = the average Non-Spin energy deployment for the five-minute clock interval from Load Resources that are part of the DSR Load |

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| [NPRR1000: Delete paragraph (3) above upon system implementation and renumber accordingly.] |

(3) For Controllable Load Resources that have a Resource Status of ONL and are acting as a Controllable Load Resource, ERCOT shall compute the CLREDP. The CLREDP will be calculated both as a percentage and in MWs as follows:

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| [NPRR963: Replace paragraph (3) above with the following upon system implementation:]  (3) For Controllable Load Resources that have a Resource Status of ONL and are acting as a Controllable Load Resource and are not part of an ESR, ERCOT shall compute the CLREDP. The CLREDP will be calculated both as a percentage and in MWs as follows: |

**CLREDP (%) = ABS[((ATPC + AEPFR)/(ASP)) – 1.0] \* 100**

**CLREDP (MW) = ABS(ATPC – (ASP – AEPFR))**

Where:

ATPC = Average Telemetered Power Consumption = the average telemetered power consumption of the Controllable Load Resource for the five-minute clock interval

AEPFR = Average Estimated Primary Frequency Response = the Estimated Primary Frequency Response (MW) will be calculated every four seconds using a Resource specific droop value where 5% droop = 0.05, the Governor Dead-Band (Hz) and Resource HSL (MW) provided by the Resource Entity, and the frequency deviation (Hz) from 60 Hz and averaged for the five-minute clock interval

ASP = Average Set Point = the time-weighted average of the Resource’s UDSP for the five-minute clock interval.

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| [NPRR963: Insert paragraph (4) below upon system implementation and renumber accordingly:]  (4) ERCOT shall compute the ESREDP for ESRs. The ESREDP is calculated for each five-minute clock interval as a percentage and in MWs as follows:  **ESREDP (%) = ABS[((ATG – GENAEPFR – ATPC - CLRAEPFR) /(GENASP – CLRASP)) – 1.0] \* 100**  **ESREDP (MW) = ABS(ATG – GENASP – GENAEPFR + CLRASP– CLRAEPFR – ATPC)**  Where:  ATG = Average Telemetered Generation = For ESRs modeled as Generation Resources, the average telemetered generation of the Generation Resource for the five-minute clock interval.  ATPC = Average Telemetered Power Consumption = For ESRs modeled as Controllable Load Resources, the average telemetered power consumption of the Controllable Load Resource for the five-minute clock interval.  ∆frequency is actual frequency minus 60 Hz.  EPFR = Estimated Primary Frequency Response (MW) = If │∆frequency│≤ Governor Dead-Band then EPFR = zero, if not then if ∆frequency > zero, EPFR = (∆frequency - Governor Dead-Band)/((droop value \* 60) – Governor Dead-Band) \* HSL \* -1, if not then if ∆frequency < zero, EPFR = (∆frequency + Governor Dead-Band)/((droop value \* 60) – Governor Dead-Band) \* HSL \* -1.  GENAEPFR = Average Estimated Primary Frequency Response = For ESRs modeled as Generation Resources, the Estimated Primary Frequency Response (MW) will be calculated every four seconds using a Resource specific droop value where 5% droop = 0.05 the Governor Dead-Band (Hz) and Resource HSL (MW) provided by the Resource Entity, and the frequency deviation (Hz) from 60 Hz and averaged for the five-minute clock interval.  GENASP = Average Set Point = the time-weighted average of the Resource’s UDSP for the five-minute clock interval.  CLRASP = Average Set Point = the time-weighted average of the Resource’s UDSP, for the five-minute clock interval.  CLRAEPFR = Average Estimated Primary Frequency Response = For ESRs modeled as Controllable Load Resources, the Estimated Primary Frequency Response (MW) will be calculated every four seconds using a Resource specific droop value where 5% droop = 0.05, the Governor Dead-Band (Hz) and Resource HSL (MW) provided by the Resource Entity, and the frequency deviation (Hz) from 60 Hz and averaged for the five-minute clock interval. |

(4) ERCOT shall post to the MIS Certified Area for each QSE and for all Generation Resources or Wind-powered Generation Resource (WGR) Groups that are not part of a DSR Portfolio, for the DSR Portfolios, and for all Controllable Load Resources:

(a) The percentage of the monthly five-minute clock intervals during which the Generation Resource or IRR Group was On-Line and released to SCED Base Point Dispatch Instructions;

(b) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL;

(c) The percentage of the monthly five-minute clock intervals during which the Generation Resource, IRR or Controllable Load Resource was awarded Regulation Service;

(d) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was less than 2.5 MW;

(e) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was less than 2.5 MW;

(f) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;

(g) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;

(h) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was greater than 5.0 MW;

(i) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was greater than 5.0 MW;

(j) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was providing Regulation Service that the GREDP was less than 2.5 MW;

(k) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was less than 2.5 MW;

(l) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awardedRegulation Service that the GREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;

(m) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;

(n) The percent of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awardedRegulation Service that the GREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was greater than 5.0 MW; and

(o) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awardedRegulation Service that the CLREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was greater than 5.0 MW.

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| [NPRR963: Replace paragraph (4) above with the following upon system implementation:]  (4) ERCOT shall post to the MIS Certified Area for each QSE and for all Generation Resources, ESRs, or Wind-powered Generation Resource (WGR) Groups that are not part of a DSR Portfolio, for the DSR Portfolios, and for all Controllable Load Resources:  (a) The percentage of the monthly five-minute clock intervals during which the Generation Resource or IRR Group was On-Line and released to SCED Base Point Dispatch Instructions;  (b) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL;  (c) The percentage of the monthly five-minute clock intervals during which the ESR was On-Line;  (d) The percentage of the monthly five-minute clock intervals during which the Generation Resource, IRR, ESR, or Controllable Load Resource was awarded Regulation Service;  (e) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was less than 2.5 MW;  (f) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was less than 2.5 MW;  (g) The percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESRESP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESRESP was less than 2.5 MW;  (h) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group or the DSR Portfolio was released to SCED that the GREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (i) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONLthat the CLREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (j) The percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (k) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group or the DSR Portfolio was released to SCED that the GREDP was greater than 5.0 MW;  (l) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was greater than 5.0 MW;  (m) The percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was greater than 5.0 MW;  (n) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was less than 2.5 MW;  (o) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was less than 2.5 MW;  (p) The percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was less than 2.5 MW;  (q) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (r) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (s) The percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (t) The percent of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR, or the DSR Portfolio was awarded Regulation Service that the GREDP was greater than 5.0 MW;  (u) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was greater than 5.0 MW; and  (v) The percent of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was greater than 5.0 MW. |

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| [NPRR1000: Replace paragraph (5) above with the following upon system implementation:]  (5) ERCOT shall post to the MIS Certified Area for each QSE and for all Generation Resources or Wind-powered Generation Resource (WGR) Groups, and for all Controllable Load Resources:  (a) The percentage of the monthly five-minute clock intervals during which the Generation Resource or IRR Group was On-Line and released to SCED Base Point Dispatch Instructions;  (b) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL;  (c) The percentage of the monthly five-minute clock intervals during which the Generation Resource, IRR or Controllable Load Resource was awarded Regulation Service;  (d) The percentage of the monthly five-minute clock intervals during which the Generation Resource, the IRR Group, or the DSR Portfolio was released to SCED that the GREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR Group was released to SCED that the GREDP was less than 2.5 MW;  (e) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was less than 2.5 MW;  (f) The percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR Group was released to SCED that the GREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR Group was released to SCED that the GREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (g) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (h) The percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR Group was released to SCED that the GREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR Group was released to SCED that the GREDP was greater than 5.0 MW;  (i) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource had a Resource Status of ONL that the CLREDP was greater than 5.0 MW;  (j) The percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR was awarded Regulation Service that the GREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR was awarded Regulation Service that the GREDP was less than 2.5 MW;  (k) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was less than 2.5 MW;  (l) The percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR was awarded Regulation Service that the GREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR was awarded Regulation Service that the GREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (m) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;  (n) The percent of the monthly five-minute clock intervals during which the Generation Resource or the IRR was awarded Regulation Service that the GREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Generation Resource or the IRR was awarded Regulation Service that the GREDP was greater than 5.0 MW; and  (o) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was awarded Regulation Service that the CLREDP was greater than 5.0 MW. |

(5) ERCOT shall calculate the GREDP/CLREDP under normal operating conditions. ERCOT shall not consider five-minute clock intervals during which any of the following events has occurred:

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| [NPRR963: Replace paragraph (5) above with the following upon system implementation:]  (5) ERCOT shall calculate the GREDP/CLREDP/ESREDP under normal operating conditions. ERCOT shall not consider five-minute clock intervals during which any of the following events has occurred: |

(a) The five-minute intervals within the 20-minute period following an event in which ERCOT has experienced a Forced Outage causing an ERCOT frequency deviation of greater than 0.05 Hz;

(b) Five-minute clock intervals in which ERCOT has issued Emergency Base Points to the QSE;

(c) The five-minute clock interval following the Forced Outage of any Resource within the QSE’s DSR Portfolio that has a Resource Status of ONDSR;

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| [NPRR1000: Delete paragraph (c) above upon system implementation and renumber accordingly.] |

(d) The five-minute clock intervals following a documented Forced Derate or Startup Loading Failure of a Generation Resource or any member IRR of an IRR Group. Upon request of the reliability monitor, the QSE shall provide the following documentation regarding each Forced Derate or Startup Loading Failure:

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| [NPRR963: Replace paragraph (d) above with the following upon system implementation:]  (d) The five-minute clock intervals following a documented Forced Derate or Startup Loading Failure of a Generation Resource, ESR, or any member IRR of an IRR Group. Upon request of the reliability monitor, the QSE shall provide the following documentation regarding each Forced Derate or Startup Loading Failure: |

(i) Its generation log documenting the Forced Outage, Forced Derate or Startup Loading Failure;

(ii) QSE (COP) for the intervals prior to, and after the event; and

(iii) Equipment failure documentation which may include, but not be limited to, Generation Availability Data System (GADS) reports, plant operator logs, work orders, or other applicable information;

(e) The five-minute clock intervals where the telemetered Resource Status is set to ONTEST such as intervals during Ancillary Service Qualification and Testing as outlined in Section 8.1.1.1, Ancillary Service Qualification and Testing, or the five-minute clock intervals during general capacity testing requirements as outlined in Section 8.1.1.2, General Capacity Testing Requirements;

(f) The five-minute clock intervals where the telemetered Resource Status is set to STARTUP;

(g) The five-minute clock intervals where a Generation Resource’s ASP is below the average telemetered LSL;

(h) Certain other periods of abnormal operations as determined by ERCOT in its sole discretion; and

(i) For a Controllable Load Resource, the five-minute clock intervals in which the computed Base Points are equal to the snapshot of its telemetered power consumption.

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| [NPRR965: Insert paragraph (j) below upon system implementation:]  (j) For QSGRs, the five-minute clock intervals in which the QSGR has a telemetered status of SHUTDOWN or telemeters an LSL of zero pursuant to Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process. |

(6) All Generation Resources that are not part of a DSR Portfolio, excluding IRRs, and all DSR Portfolios shall meet the following GREDP criteria for each month. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:

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| [NPRR963: Replace paragraph (6) above with the following upon system implementation:]  (6) All Generation Resources that are not part of an ESR or DSR Portfolio, excluding IRRs, and all DSR Portfolios shall meet the following GREDP criteria for each month. ERCOT will report non-compliance of the following performance criteria to the reliability monitor: |

(a) A Generation Resource or DSR Portfolio, excluding an IRR, must have a GREDP less than the greater of X% or Y MW for 85% of the five-minute clock intervals in the month during which GREDP was calculated.

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| [NPRR1000: Replace paragraph (a) above with the following upon system implementation:]  (a) A Generation Resource, excluding an IRR, must have a GREDP less than the greater of X% or Y MW for 85% of the five-minute clock intervals in the month during which GREDP was calculated. |

(b) If at the end of the month during which GREDP was calculated a DSR Portfolio has a GREDP less than X% or Y MW for 85% of the five-minute clock intervals, the reliability monitor shall, at the request of the QSE with the DSR Portfolio, recalculate GREDP excluding the five-minute clock intervals following the Forced Outage of any Resource within the QSE’s DSR Portfolio that has a Resource Status of ONDSR continuing until the start of the next Operating Hour for which the QSE is able to adjust. If the Forced Outage of the Resource occurs within ten minutes of the start of the next Operating Hour, then the reliability monitor shall not consider any of the five-minute intervals between the time of the Forced Outage and continuing until the start of the second Operating Hour for which the QSE is able to adjust. The requesting QSE shall provide to the reliability monitor information validating the Forced Outage including the time of the occurrence of the Forced Outage and documentation of the last submitted COP status prior to the Forced Outage of the Resource for the intervals in dispute.

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| [NPRR1000: Delete paragraph (b) above upon system implementation and renumber accordingly.] |

(c) Additionally, all Generation Resources that are not part of a DSR Portfolio, excluding IRRs, and all DSR Portfolios will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources must meet the following GREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:

(i) A Generation Resource or DSR Portfolio, excluding an IRR, must have a GREDP less than the greater of X% or Y MW. A Generation Resource or DSR Portfolio cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and GREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA.

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| [NPRR963: Replace paragraph (c) above with the following upon system implementation:]  (c) Additionally, all Generation Resources that are not part of an ESR or DSR Portfolio, excluding IRRs, and all DSR Portfolios will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources must meet the following GREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:  (i) A Generation Resource or DSR Portfolio, excluding an IRR or Generation Resource part of an ESR, must have a GREDP less than the greater of X% or Y MW. A Generation Resource or DSR Portfolio cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and GREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA. |

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| [NPRR1000: Replace paragraph (c) above with the following upon system implementation:]  (c) Additionally, all Generation Resources, excluding IRRs, will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources must meet the following GREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:  (i) A Generation Resource, excluding an IRR, must have a GREDP less than the greater of X% or Y MW. A Generation Resource cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and GREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA. |

(7) All IRRs and IRR Groups shall meet the following GREDP criteria for each month. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:

(a) An IRR or IRR Group must have a GREDP less than Z% or the ATG must be less than the expected MW output for 95% of the five-minute clock intervals in the month when the Resource or a member IRR of an IRR Group received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the IRR’s HSL used by SCED. The expected MW output includes the Resource’s Base Point, Regulation Service instructions, and any expected Primary Frequency Response.

(b) Additionally, all IRRs and IRR Groups will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources and IRR Groups must meet the following GREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:

(i) An IRR or IRR Group must have a GREDP less than Z% or the ATG must be less than the expected MW output. An IRR or IRR Group cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and the Resource or a member of an IRR Group received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the IRR’s HSL used by SCED. The performance will be measured separately for each instance in which ERCOT has declared EEA.

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| ***[NPRR879: Replace paragraph (7) above with the following upon system implementation:]***  (7) All IRRs and IRR Groups shall meet the following GREDP criteria for each month. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:  (a) An IRR or IRR Group must have a GREDP less than Z% or the ATG must be less than the expected MW output for 95% of the five-minute clock intervals in the month when the Resource or a member IRR of an IRR Group was not awarded Ancillary Service and received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the IRR’s HSL used by SCED. The expected MW output includes the Resource’s Base Point, Regulation Service instructions, and any expected Primary Frequency Response.  (b) An IRR or IRR Group must have a GREDP less than the greater of X% or Y MW for 85% of the five-minute clock intervals in the month during which the Resource or a member IRR of an IRR Group was awarded Ancillary Service .  (c) Additionally, all IRRs and IRR Groups will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources and IRR Groups must meet the following GREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:  (i) An IRR or IRR Group must have a GREDP less than Z% or the ATG must be less than the expected MW output. An IRR or IRR Group cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and the Resource or a member of an IRR Group was not awarded Ancillary Service and received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the IRR’s HSL used by SCED. The performance will be measured separately for each instance in which ERCOT has declared EEA.  (ii) An IRR or IRR Group must have a GREDP less than the greater of X% or Y MW when the Resource or a member IRR of an IRR Group was awarded Ancillary Service . An IRR or IRR Group cannot fail this criteria more than three five-minute clock intervals during which EEA was declared. The performance will be measured separately for each instance in which ERCOT has declared EEA. |

(8) All Controllable Load Resources shall meet the following CLREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the reliability monitor:

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| [NPRR963: Replace paragraph (8) above with the following upon system implementation:]  (8) All Controllable Load Resources that are not part of an ESR shall meet the following CLREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the reliability monitor: |

(a) A Controllable Load Resource must have a CLREDP less than the greater of X% or Y MW for 85% of the five-minute clock intervals in the month during which CLREDP was calculated.

(b) Additionally, all Controllable Load Resources will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources must meet the following CLREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following Performance criteria to the reliability monitor:

(i) A Controllable Load Resource must have a CLREDP less than the greater of X% or Y MW. A Controllable Load Resource cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and CLREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA.

(c) For Controllable Load Resources which are providing RRS or Non-Spin, the following intervals will be excluded from these calculations:

(i) Five-minute clock intervals which begin ten minutes or less after a deployment of RRS was deployed to the Resource;

(ii) Five-minute clock intervals which begin ten minutes or less after a recall of RRS when the Resource was deployed for RRS;

(iii) Five-minute clock intervals which begin 30 minutes or less after a deployment of Non-Spin was deployed to the Resource; and

(iv) Five-minute clock intervals which begin 30 minutes or less after a recall of Non-Spin when the Resource was deployed for Non-Spin.

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| ***[NPRR863: Replace paragraph (c) above with the following upon system implementation:]***  (c) For Controllable Load Resources which are providing RRS, ECRS, or Non-Spin, the following intervals will be excluded from these calculations:  (i) Five-minute clock intervals which begin ten minutes or less after a deployment of RRS or ECRS was deployed to the Resource;  (ii) Five-minute clock intervals which begin ten minutes or less after a recall of RRS or ECRS when the Resource was deployed for RRS or ECRS;  (iii) Five-minute clock intervals which begin 30 minutes or less after a deployment of Non-Spin was deployed to the Resource; and  (iv) Five-minute clock intervals which begin 30 minutes or less after a recall of Non-Spin when the Resource was deployed for Non-Spin. |

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| [NPRR963: Insert paragraph (9) below upon system implementation and renumber accordingly:]  (9) All ESRs shall meet the following ESREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:  (a) An ESR must have an ESREDP less than the greater of V% or W MW for 85% of the five-minute clock intervals in the month during which ESREDP was calculated.  (b) Additionally, all ESRs will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources must meet the following ESREDP criteria for the time window that includes all five-minute clock intervals during which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:  (i) An ESR must have an ESREDP less than the greater of V% or W MW. An ESR cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and ESREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA. |

(9) The GREDP/CLREDP performance criteria in paragraphs (6) through (8) above shall be subject to review and approval by TAC. The GREDP/CLREDP performance criteria variables X, Y, and Z shall be posted to the MIS Public Area no later than three Business Days after TAC approval.

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| [NPRR963: Replace paragraph (9) above with the following upon system implementation:]  (9) The GREDP/CLREDP/ESREDP performance criteria in paragraphs (8) through (11) above shall be subject to review and approval by TAC. The GREDP/CLREDP/ESREDP performance criteria variables V, W, X, Y, and Z shall be posted to the MIS Public Area no later than three Business Days after TAC approval. |

(10) If at the end of the month during which GREDP was calculated, a non-DSR Resource or a QSE with DSR Resources, has a GREDP less than X% or Y MW for 85% of the five-minute clock intervals, the reliability monitor shall, at the request of the QSE, recalculate GREDP excluding the five-minute clock intervals when a Resource is deployed above the unit’s ramp rate due to ramp rate sharing between energy and Regulation Service. The requesting QSE shall provide to the reliability monitor information validating the ramp rate violation for the intervals in dispute.

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| [NPRR1000: Replace paragraph (10) above with the following upon system implementation:]  (10) If at the end of the month during which GREDP was calculated, a Resource has a GREDP less than X% or Y MW for 85% of the five-minute clock intervals, the reliability monitor shall, at the request of the QSE, recalculate GREDP excluding the five-minute clock intervals when a Resource is deployed above the unit’s ramp rate due to ramp rate sharing between energy and Regulation Service. The requesting QSE shall provide to the reliability monitor information validating the ramp rate violation for the intervals in dispute. |

**8.1.1.4.2 Responsive Reserve Energy Deployment Criteria**

(1) Control performance during periods in which RRS has been self-deployed shall be based on the requirements below and failure to meet any one of these requirements may be reported to the Reliability Monitor as non-compliance:



(a) A QSE providing RRS must reserve sufficient PFR capable capacity on each Generation Resource with a RRS award or must reserve sufficient capacity capable of FFR to supply the full amount of RRS awarded to that Resource. The QSE shall not use non-FRC, such as power augmentation capacity on a Generation Resource, to provide RRS.

(b) ERCOT shall evaluate the Primary Frequency Response of all RRS providers as calculated in Nodal Operating Guide Section 8, Attachment J, Initial and Sustained Measurements for Primary Frequency Response.

(2) For all Frequency Measurable Events (FMEs), ERCOT shall use the recorded data for each two-second scan rate value of real power output for each Generation Resource, Settlement Only Transmission Generator (SOTG), Settlement Only Transmission Self-Generator (SOTSG), Resource capable of FFR providing RRS, and Controllable Load Resource. ERCOT shall use the recorded MW data beginning one minute before the start of the frequency excursion event until ten minutes after the start of the frequency excursion event. Satisfactory performance for those Resources with an RRS award must be measured by comparing actual Primary Frequency Response to the expected Primary Frequency Response as required in the Operating Guides.

(3) ERCOT shall monitor the Primary Frequency Response that is delivered during FMEs of Generation Resources, SOTGs, SOTSGs, Resources capable of FFR, and Controllable Load Resources with RRS responsibilities using the methodology specified in the Operating Guides. ERCOT shall monitor the Primary Frequency Response that is delivered during FMEs of Controllable Load Resources, relay response for Loads and Generation Resources operating in the synchronous condenser fast-response mode providing RRS at the frequency specified in paragraph (3)(b) of Section 3.18, Resource Limits in Providing Ancillary Service.

(4) For Resources providing FFR, once the FFR is deployed, the Resource must stay deployed for the duration of the sustained response period, defined as 15 minutes or until the time of recall instruction from ERCOT, whichever occurs first. A Load Resource that is controlled by a high-set under-frequency relay and is providing FFR may only withdraw energy from the grid after the frequency has recovered to 60 Hz and Physical Responsive Capability (PRC) is above 2,500 MW, or if instructed to do so by ERCOT.

(5) For a Resource providing RRS with a Resource Status of ONSC, once the RRS is deployed, the Resource must maintain the response until recalled by ERCOT.

(6) For a Load Resource that is controlled by a high-set under-frequency relay and is providing RRS, once the RRS is deployed, the Resource must maintain the response to the deployment until recalled by ERCOT.

(7) For QSEs with Load Resources, excluding Controllable Load Resources, ten minutes following deployment instruction the sum of the QSE’s Load Resource response shall not be less than 95% of the requested MW deployment, nor more than 150% of the lesser of the following:

(i) The QSE’s award for RRS from non-Controllable Load Resources; or

(ii) The requested MW deployment.

The QSE’s portfolio shall maintain this response until recalled.

(8) For Load Resources, excluding Controllable Load Resources, associated with a QSE that does not successfully deploy as defined under this Section, ERCOT shall evaluate, identify and investigate each Load Resource that contributed to such failure, in order to determine failure under paragraph (9) of Section 8.1.1.1, Ancillary Service Qualification and Testing.

(9) For a QSE self-providing RRS on Load Resources, excluding Controllable Load Resources that have been deployed for RRS, the QSE may move the self-provided amount to another Load Resource, while maintaining the deployment instructions on the previously deployed Load Resource, if:

(a) The Load Resource to which the RRS is to be moved is not a Controllable Load Resource and has not been deployed for RRS; and

(b) The self-provided amount of RRS is within the QSE’s portfolio.

(10) During periods when the Load level of a Load Resource (excluding Controllable Load Resources) has been affected by a Dispatch Instruction from ERCOT, the performance of a Load Resource in response to a Dispatch Instruction must be determined by subtracting the Load Resource’s actual Load response from its Baseline. “Baseline” capacity is calculated by measuring the average of the real power consumption for five minutes before the Dispatch Instruction if the Load level of a Load Resource had not been affected by a Dispatch Instruction from ERCOT. The actual Load response is the average of the real power consumption data being telemetered to ERCOT during the Settlement Interval indicated in the Dispatch Instruction.

**8.1.1.4.3 Non-Spinning Reserve Service Energy Deployment Criteria**

(1) ERCOT shall, as part of its Ancillary Service deployment procedure under Section 6.5.7.6.2.3, Non-Spinning Reserve Service Deployment, include all performance metrics for a Resource receiving a Non-Spin recall instruction from ERCOT.

(2) A Non-Spin Dispatch Instruction from ERCOT must respect the minimum runtime of a Generation Resource.

(3) Control performance during periods in which ERCOT has manually deployed Non-Spin shall be based on the requirements below and failure to meet any one of these requirements for the greater of one or 5% of Non-Spin deployments during a month shall be reported to the Reliability Monitor as non-compliance:

(a) Off-Line Generation Resources, within 25 minutes following a deployment instruction, must be On-Line with an Energy Offer Curve and the telemetered net generation must be greater than or equal to the Resource’s telemetered LSL multiplied by P1 where P1 is defined in the “ERCOT and QSE Operations Business Practices During the Operating Hour.” The Resource Status that must be telemetered indicating that the Resource has come On-Line with an Energy Offer Curve is ON as described in paragraph (5)(b)(i) of Section 3.9.1, Current Operating Plan (COP) Criteria.

(b) If an Off-Line Generation Resource experiences a Startup Loading Failure (excluding those caused by operator error), the Resource may be considered for exclusion from performance non-compliance if the QSE provides to ERCOT the following documentation regarding the incident:

(i) Its generation log documenting the Startup Loading Failure; and

(ii) Equipment failure documentation such as, but not limited to, GADS reports, plant operator logs, work orders, or other applicable information.

(c) Controllable Load Resources must be available to SCED, and must have a Real-Time Market (RTM) Energy Bid and the telemetered net real power consumption must be greater than or equal to the Resource’s telemetered LPC.

(4) Once Non-Spin capacity has been manually deployed by ERCOT, the Resource’s Non-Spin capacity shall remain available for dispatch by SCED until ERCOT issues a recall instruction or the Resource has exhausted its ability to maintain the deployed capacity after meeting the requirements of paragraph (2) of Section 8.1.1.3.3, whichever occurs first.

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| ***[NPRR863: Insert Section 8.1.1.4.4 below upon system implementation:]***  **8.1.1.4.4 ERCOT Contingency Reserve Service Energy Deployment Criteria**  (1) Control performance during periods in which ERCOT has manually deployed ECRS shall be based on the requirements below and failure to meet any one of these requirements shall be reported to the Reliability Monitor as non-compliance:  (a) For a Resource providing ECRS with a Resource Status of ONSC, once the ECRS is deployed, the Resource must maintain the response until recalled by ERCOT.  (b) For QSEs with Load Resources, excluding Controllable Load Resources, ten minutes following deployment instruction the sum of the QSE’s Load Resource response shall not be less than 95% of the requested MW deployment, nor more than 150% of the lesser of the following:  (i) The QSE’s awards for ECRS from non-Controllable Load Resources; or  (ii) The requested MW deployment.  The QSE’s portfolio shall maintain this response until recalled..  (c) For Load Resources, excluding Controllable Load Resources, associated with a QSE that does not successfully deploy as defined under this Section, ERCOT shall evaluate, identify and investigate each Load Resource that contributed to such failure, in order to determine failure under paragraph (9) of Section 8.1.1.1, Ancillary Service Qualification and Testing.  (d) For a QSE self-providing ECRS on a Load Resource, excluding Controllable Load Resources that have been deployed, the QSE may move the self-provided amount to another Load Resource, while maintaining the deployment instructions on the previously deployed Load Resources, if:  (i) The Load Resource to which the ECRS is to be moved is not a Controllable Load Resource and has not been deployed for ECRS; and  (ii) The self-provided amount of ECRS is within the QSE’s portfolio.  (e) During periods when the Load level of a Load Resource (excluding Controllable Load Resources) has been affected by a Dispatch Instruction from ERCOT, the performance of a Load Resource in response to a Dispatch Instruction must be determined by subtracting the Load Resource’s actual Load response from its Baseline. “Baseline” capacity is calculated by measuring the average of the real power consumption for five minutes before the Dispatch Instruction if the Load level of a Load Resource had not been affected by a Dispatch Instruction from ERCOT. The actual Load response is the average of the real power consumption data being telemetered to ERCOT during the Settlement Interval indicated in the Dispatch Instruction. |

***8.1.2 Current Operating Plan (COP) Performance Requirements***

(1) Each QSE representing a Resource must submit a COP in accordance with Section 3.9, Current Operating Plan (COP).

(2) For each QSE, ERCOT shall post for each month the number of Operating Hours during which a Reliability Unit Commitment (RUC)-committed QSE Resource, not Off-Line as the result of a Forced Outage, failed to be On-Line and released to SCED for deployment within the first 15 minutes of the RUC-Commitment Hour. QSEs shall have no more than three hours during an Operating Day and no more than 74 hours during a month that contains one or more of these events.

(3) ERCOT shall post for each QSE for each month the number of Operating Hours during which a RUC-committed Resource with a cold start time of one hour or less, not Off-Line as the result of a Forced Outage, failed to be On-Line and released to SCED (has reached its physical LSL) within its cold start time by the start of the Operating Hour for which it was RUC-committed. Any Resource with more than one occurrence during a month whereby the cold start time is not met shall be removed from special consideration pursuant to paragraph (7) of Section 5.5.2, Reliability Unit Commitment (RUC) Process, for a period of 90 days, beginning with the next Operating Day following the second occurrence within a month.

**8.5.1.1 Governor in Service**

(1) At all times a Generation Resource, Settlement Only Transmission Generator (SOTG), or Settlement Only Transmission Self-Generator (SOTSG) is On-Line, its Governor must remain in service and be allowed to respond to all changes in system frequency except during startup, shutdown, or testing. A Generation Entity may not reduce Primary Frequency Response on an individual Generation Resource or Settlement Only Generator (SOG) even during abnormal conditions without ERCOT’s consent (conveyed by way of the Resource Entity’s Qualified Scheduling Entity (QSE)) unless equipment damage is imminent. All Generation Resources, SOTGs, and SOTSGs that have capacity available to either increase output or decrease output in Real-Time must provide Primary Frequency Response, which may make use of that available capacity. Only Generation Resources providing Regulation Up (Reg-Up), Regulation Down (Reg-Down), Responsive Reserve (RRS), or Non-Spinning Reserve (Non-Spin) from On-Line Resources, as specified in Section 8.1.1, QSE Ancillary Service Performance Standards, shall be required to reserve capacity that may also be used to provide Primary Frequency Response.

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| [NPRR863 and NPRR989: Replace applicable portions of paragraph (1) above with the following upon system implementation:]  (1) At all times a Generation Resource, Energy Storage Resource (ESR), Settlement Only Transmission Generator (SOTG), or Settlement Only Transmission Self-Generator (SOTSG) is On-Line, its Governor must remain in service and be allowed to respond to all changes in system frequency except during startup, shutdown, or testing. A Resource Entity may not reduce Primary Frequency Response on an individual Generation Resource, ESR, or Settlement Only Generator (SOG) even during abnormal conditions without ERCOT’s consent (conveyed by way of the Resource Entity’s Qualified Scheduling Entity (QSE)) unless equipment damage is imminent. All Generation Resources, ESRs, SOTGs, and SOTSGs that have capacity available to either increase output or decrease output in Real-Time must provide Primary Frequency Response, which may make use of that available capacity. Only Generation Resources or ESRs providing Responsive Reserve (RRS), Regulation Up (Reg-Up), Regulation Down (Reg-Down), ERCOT Contingency Reserve Service (ECRS), or Non-Spinning Reserve (Non-Spin) from On-Line Resources, as specified in Section 8.1.1, QSE Ancillary Service Performance Standards, shall be required to reserve capacity that may also be used to provide Primary Frequency Response. |

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| [NPRR863 and NPRR989: Insert applicable portions of paragraph (2) below upon system implementation:]  (2) Generation Resources, ESRs, SOTGs, and SOTSGs that do not have an RRS or Regulation Service Ancillary Service award shall set their Governor Dead-Band no greater than ±0.036 Hz from nominal frequency of 60 Hz. A Generation Resource, SOTG, or SOTSG that widens its Governor Dead-Band greater than what is prescribed in Nodal Operating Guide Section 2.2.7, Turbine Speed Governors, must update its Resource Registration data with the new dead-band value. |