**ERCOT Nodal Protocols**

**Section 8: Performance Monitoring**

**January 1, 2021**

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# Performance Monitoring

(1) This Section describes how the performance of ERCOT, Transmission Service Providers (TSPs) and Qualified Scheduling Entities (QSEs) are measured against the requirements of these Protocols. All performance measures must be approved by the Technical Advisory Committee (TAC) prior to implementation. Summaries of the performance of each TSP and QSE and of ERCOT are to be made available on the Market Information System (MIS) Secure Area unless otherwise stated.

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| [NPRR857: Replace paragraph (1) above with the following upon system implementation:]  (1) This Section describes how the performance of ERCOT, Transmission Service Providers (TSPs), Direct Current Tie Operators (DCTOs), and Qualified Scheduling Entities (QSEs) are measured against the requirements of these Protocols. All performance measures must be approved by the Technical Advisory Committee (TAC) prior to implementation. Summaries of the performance of each TSP, DCTO, and QSE and of ERCOT are to be made available on the Market Information System (MIS) Secure Area unless otherwise stated. |

8.1 QSE and Resource Performance Monitoring

(1) ERCOT shall develop a Technical Advisory Committee (TAC)- and ERCOT Board-approved Qualified Scheduling Entity (QSE) and Resource monitoring program to be included in the Operating Guides. Nothing in this Section changes the process for amending the Operating Guides. The metrics developed by ERCOT and approved by TAC and the ERCOT Board must include the provisions of this Section.

(2) Each QSE and Resource shall meet performance measures as described in this Section and in the Operating Guides.

(3) ERCOT shall monitor and post the following categories of performance:

(a) Real-Time data, for QSEs:

(i) Telemetry performance

(b) Regulation control performance, for QSEs and as applicable, Resource-specific performance (see also Section 8.1.1, QSE Ancillary Service Performance Standards);

(c) Hydro responsive testing for Generation Resources;

(d) Supplying and validating data for generator models, as requested by ERCOT, for Generation Resources;

(e) Outage scheduling and coordination, for QSEs and Resources;

(f) Resource-specific Responsive Reserve (RRS) performance for QSEs and Resources;

(g) Resource-specific Non-Spinning Reserve (Non-Spin) performance, for QSEs and Resources;

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| ***[NPRR863: Insert paragraph (h) below upon system implementation and renumber accordingly:]***  (h) Resource-specific ERCOT Contingency Reserve Service (ECRS) performance for QSEs and Resources; |

(h) Outage reporting, by QSEs for Resources;

(i) Current Operating Plan (COP) metrics, for QSEs; and

(j) Day-Ahead Reliability Unit Commitment (DRUC) and Hourly Reliability Unit Commitment (HRUC) commitment performance by QSEs and Generation Resources.

8.1.1 QSE Ancillary Service Performance Standards

(1) Each QSE and its Resources that provide Ancillary Service must meet performance measures set out in these Protocols and the Operating Guides. ERCOT shall develop a TAC- and ERCOT Board-approved Ancillary Service monitoring program to evaluate the performance of QSEs and Resources providing Ancillary Services prior to the Texas Nodal Market Implementation Date. This program must include monitoring of capacity availability and energy deployments as described below and in Section 6.5.7.5, Ancillary Services Capacity Monitor.

**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, Generation Resource Base-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.

(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 Responsibility for RRS, or

(b) The requested MW deployment.

The requested MW deployment will be the sum of the Resource’s Responsibility for RRS 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 Ancillary Service Resource Responsibility for RRS 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 Ancillary Service Resource Responsibility for RRS; or

(b) The MW deployment.

The requested MW deployment for Resources capable of FFR will be the sum of the Resource’s Ancillary Service Resource Responsibility for RRS 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 Ancillary Service Resource Responsibility for RRS 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.

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| [NPRR863, NPRR963, and NPRR1011: Replace applicable portions of Section 8.1.1.1 above with the following upon system implementation for NPRR863 or NPRR963; or upon system implementation of Real-Time Co-Optimization (RTC) project for NPRR1011:]  **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, 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 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 (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. The QSE shall immediately upon receiving the VDI release all Ancillary Service obligations carried by the unit to be tested and 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.

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| [NPRR1011: Replace paragraph (2) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]  (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 ERCOT website.

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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 ERCOT website. |

(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.

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| [NPRR1011: Insert paragraph (3) below upon system implementation of the Real-Time Co-Optimization (RTC) project:]  (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 providing Reg-Up or Reg-Down shall provide communications equipment to receive telemetered control deployments of power from ERCOT.

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| [NPRR1011 and NPRR1014: Replace applicable portions of paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011; or upon system implementation for NPRR1014:]  (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 Resource providing Fast Responding Regulation Service (FRRS) shall be capable of independently detecting and recording system frequency with an accuracy of at least one mHz and a resolution of no less than 32 samples per second. The Resource shall also be capable of measuring and recording MW output with a resolution of no less than 32 samples per second.

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| [NPRR1011 and NPRR1014: Delete paragraph (4) above upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011; or upon system implementation for NPRR1014; and renumber accordingly] |

(5) 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 and NPRR1014: Replace applicable portions of 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.  (i) 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%.  (ii) 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.  (iii) During at least one five-minute duration interval selected to evaluate each of the Reg-Up and Reg-Down amounts being tested, the 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 Deployment Performance, over the entire five minute interval must be less than or equal to 3.0%.  (iv) For an Energy Storage Resource (ESR), in all other test sequence intervals, the Resource’s measured ESREDP must be less than or equal to 3.0% 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.

(6) A QSE may also qualify a Resource to provide Fast Responding Regulation Up Service (FRRS-Up), Fast Responding Regulation Down Service (FRRS-Down), or both. In addition to the test criteria described in paragraph (5) above, ERCOT shall verify the following capabilities through testing:

(a) The Resource will be required to demonstrate that it can deploy within 60 cycles of either (i) receipt of a deployment signal from ERCOT, or (ii) a deviation of frequency in excess of +/-0.09 Hz from 60 Hz.

(b) Upon deployment, the Resource will be required to demonstrate that it can sustain the deployment for a minimum of eight minutes at a minimum level of 95% and a maximum level of 110% of the proposed maximum capacity obligation.

(c) ERCOT shall use the Resource’s high-resolution recorded frequency and MW output data to determine whether the Resource met its performance obligations during the test.

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

(e) A QSE representing a Resource qualified to provide FRRS shall not offer to provide more FRRS than the maximum capacity obligation that the Resource is qualified to provide, as shown in the certificate provided to the QSE and the Resource.

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| [NPRR1011 and NPRR1014: Replace applicable portions of paragraph (6) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011; or upon system implementation for NPRR1014:]  (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 the Resource’s Ancillary Service Resources Responsibility for RRS within ten minutes of the notice to deploy RRS, must be immediately responsive to system frequency, and must be able to maintain the scheduled level of deployment for the period of service commitment. 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 scheduled 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 providing 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 Resource Responsibility. 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 monitor the QSEs telemetry of the Resource’s Ancillary Service Schedule for an update within 15 seconds. 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.

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| [NPRR863, NPRR1011, and NPRR1014: Replace applicable portions of Section 8.1.1.2.1.2 above with the following upon system implementation for NPRR863 or NPRR1014; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011:]  **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;  (d) Load Resources controlled by high-set under-frequency relays; and  (e) Energy Storage Resources (ESRs).  (2) The amount of RRS provided by individual Generation Resources or ESRs is limited by the ERCOT-calculated maximum MW amount of RRS for the Generation Resource or ESR subject to its verified droop performance as described in the Nodal Operating Guide. The default value for any newly qualified Generation Resource or ESR 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 a Resource 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 Resource providing Non-Spin must be capable of being synchronized and ramped to its Ancillary Service Schedule 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) A Controllable Load Resource providing Non-Spin must be qualified to participate in SCED and must provide a telemetered output signal, including breaker status.

(3) Each Generation Resource and Controllable Load Resource providing Non-Spin must meet additional technical requirements specified in this Section.

(4) 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.

(5) Each QSE shall ensure that each Resource is able to meet the Resource’s obligations to provide the Ancillary Service Resource Responsibility. Each Generation Resource and Controllable Load Resource providing Non-Spin must meet additional technical requirements specified in this Section.

(6) For any Resource requesting qualification for Non-Spin, 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 Generation Resources: during the test window, ERCOT shall send a message to the QSE representing a Generation Resources to deploy Non-Spin. ERCOT shall monitor the adjustment of the Generation Resource’s Non-Spin Ancillary Service Schedule within five minutes for Resources On-Line. 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 Generation Resource given the current operating conditions of the system and determine the Resource’s qualification to provide Non-Spin.

(c) For Controllable Load Resources, ERCOT shall send an instruction to deploy Non-Spin. ERCOT shall measure the Resource’s response as described under Section 8.1.1.4.3.

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| [NPRR1011: Replace Section 8.1.1.2.1.3 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]  **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. |

8.1.1.2.1.4 Voltage Support Service Qualification

(1) The Resource Entity must verify and maintain its stated Reactive Power capability for each of its Generation Resources providing Voltage Support Service (VSS), as required by the Operating Guides. Generation Resources providing VSS reactive capability limits shall be specified as follows: lagging reactive capability should be specified using the Summer/Fall voltage profile, and leading capability specified using the Winter/Spring voltage profile.

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| [NPRR989: Replace paragraph (1) above with the following upon system implementation:]  (1) The Resource Entity must verify and maintain its stated Reactive Power capability for each of its Generation Resources and ESRs providing Voltage Support Service (VSS), as required by the Operating Guides. Generation Resources and ESRs providing VSS reactive capability limits shall be specified as follows: lagging reactive capability should be specified using the Summer/Fall voltage profile, and leading capability specified using the Winter/Spring voltage profile. |

(2) The Resource Entity shall conduct reactive capacity qualification tests to verify the maximum leading and lagging reactive capability of all Generation Resources required to provide VSS. Reactive capability tests are performed during the resource commissioning process and at a minimum of once every five years or within 12 months following the discovery of a change that affects its real power or Reactive Power capability by more than 10% of the last value provided by the Resource Entity via the Resource Registration process and is expected to last more than six months. Mothballed Generation Resources that have not been tested within the last five years shall be verified within 12 calendar months upon return to service. ERCOT may require additional testing if it has information indicating that current data is inaccurate. The Resource Entity is not obligated to place Generation Resources On-Line solely for the purposes of testing. The reactive capability tests must be conducted at a time agreed to in advance by the Resource Entity, its QSE, the applicable TSP, and ERCOT.

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| [NPRR989: Replace paragraph (2) above with the following upon system implementation:]  (2) The Resource Entity shall conduct reactive capacity qualification tests to verify the maximum leading and lagging reactive capability of all Generation Resources and ESRs required to provide VSS. Reactive capability tests are performed during the resource commissioning process and at a minimum of once every five years or within 12 months following the discovery of a change that affects its real power or Reactive Power capability by more than 10% of the last value provided by the Resource Entity via the Resource Registration process and is expected to last more than six months. Mothballed Generation Resources or ESRs that have not been tested within the last five years shall be verified within 12 calendar months upon return to service. ERCOT may require additional testing if it has information indicating that current data is inaccurate. The Resource Entity is not obligated to place Generation Resources or ESRs On-Line solely for the purposes of testing. The reactive capability tests must be conducted at a time agreed to in advance by the Resource Entity, its QSE, the applicable TSP, and ERCOT. |

(3) Leading and lagging reactive operating limits must be demonstrated following the reactive power verification test procedure as more fully described in Nodal Operating Guide Section 3.3.2, Unit Reactive Capability Requirements.

(4) The Resource Entity shall perform the Automatic Voltage Regulator (AVR) tests and shall supply AVR data as specified in the Operating Guides. The AVR tests must be performed on initial qualification. The AVR tests must be conducted at a time agreed on in advance by the Resource Entity, its QSE, the applicable TSP, and ERCOT.

8.1.1.2.1.5 System Black Start Capability Qualification and Testing

(1) A Resource is qualified to be a Black Start Resource if it has met the following requirements:

(a) Verified control communication path performance;

(b) Verified primary and alternate voice circuits for receipt of instructions;

(c) Passed the “Basic Starting Test” as defined below;

(d) Passed the “Line-Energizing Test” as defined below;

(e) Passed the “Load-Carrying Test” as defined below;

(f) Passed the “Next Start Resource Test” as defined below;

(g) If not starting itself, has an ERCOT-approved firm standby power contract with deliverability under Blackout circumstances from a non-ERCOT Control Area that can be finalized upon selection as a Black Start Resource;

(h) If not starting itself, has an ERCOT approved agreement with the necessary TSPs for access to another power pool, for coordination of switching during a Blackout or Partial Blackout, for coordination of maintenance through the ERCOT Outage Scheduler for all non-redundant transmission startup feeds;

(i) If dependent upon non-ERCOT transmission resources, agreements providing this Transmission Service have been provided in the proposal; and

(j) Demonstrated to ERCOT’s satisfaction that the Resource has successfully completed remediation to any weather-related limitation disclosed as part of the Black Start Service (BSS) bid.

(2) On successful demonstration of system BSS capability, ERCOT shall certify that the Black Start Resource is capable of providing system BSS capacity and shall provide a copy of the certificate to the Resource Entity of the Black Start Resource. Qualification shall be valid for the time frames set forth below. Except under extenuating circumstances, as reasonably determined by ERCOT, all qualification testing for the next year of BSS must be completed by June 1st of each year.

(3) ERCOT may limit the number of qualification retests allowed. Qualification retesting is required only for the aspect of system BSS capability for which the Black Start Resource failed. If a Black Start Resource under an existing Black Start Agreement does not successfully re-qualify within two months of failing a test described herein, ERCOT shall decertify the Black Start Resource for the remainder of the calendar year as described in Section 7, Black Start Decertification, of Section 22, Attachment D, Standard Form Black Start Agreement. The following tests are required for BSS qualification:

(a) The “Basic Starting Test” includes the following:

(i) The basic ability of the Black Start Resource to start itself, or start from a normally open interconnection to another provider not inside the ERCOT interconnection, without support from the ERCOT System;

(ii) Annual testing, either as a stand-alone test or part of the Line Energizing and Load-Carrying Tests, and the test is performed during a one-week period agreed to in advance by the Black Start Resource and ERCOT and must not cause outage to ERCOT Customer Load or the availability of other Resources to the ERCOT market;

(iii) Confirmation of the dates of the test with the Black Start Resource by ERCOT;

(iv) Isolation of the Black Start Resource, including all auxiliary Loads, from the ERCOT System, except for the transmission that connects the Resource to a provider not inside the ERCOT interconnection if the startup power is supplied by a firm standby contract. Black Start Resources starting with the assistance of a provider not inside the ERCOT interconnection through a firm standby agreement will connect to provider not inside the ERCOT interconnection, start-up, carry internal Load, disconnect from the provider not inside the ERCOT interconnection if not supplied through a black-start capable Direct Current Tie (DC Tie), and continue equivalently to what is required of other Black Start Resources;

(v) The ability of the Black Start Resource to start without assistance from the ERCOT System, except for the transmission that connects the Resource to a provider not inside the ERCOT interconnection if the startup power is supplied by a firm standby contract;

(vi) The ability of the Black Start Resource to remain stable (in both frequency and voltage) while supplying only its own auxiliary Loads or Loads in the immediate area for at least 30 minutes;

(vii) The Black Start Resource must have verified that its Volts/Hz relay, over-excitation limiter, and under-excitation limiter are set properly and that no protection devices will trip the Black Start Resource within the required reactive range. The Resource Entity for the Black Start Resource shall provide ERCOT with data to verify these settings; and

(viii) Each Black Start Resource must pass a Basic Starting Test once each calendar year.

(b) The “Line-Energizing Test” must be conducted at a time agreed on by the Black Start Resource, TSP or Distribution Service Provider (DSP), and ERCOT and includes the following:

(i) Energizing transmission with the Black Start Resource when conditions permit as determined by the TSP or DSP but at least once every three years;

(ii) De-energizing sufficient transmission in such manner that when energized by the Black Start Resource it demonstrates the Black Start Resource’s ability to energize enough transmission to deliver to the Loads the Resource’s output that ERCOT’s restoration plan requires the Black Start Resource to supply. ERCOT shall be responsible for transmission connections and operations that are compatible with the capabilities of the Black Start Resource;

(iii) Conducting a Basic Starting Test;

(iv) Energizing transmission with the Black Start Resource of the previously de-energized transmission, while monitoring frequency and voltages at both ends of the line. Alternatively, if ERCOT agrees, the transmission line may be connected to the Black Start Resource before starting, allowing the Resource to energize the line as it comes up to speed;

(v) Stable operation of the Black Start Resource (in both frequency and voltage) while supplying only its auxiliary Loads or external Loads for at least 30 minutes;

(vi) This test may be performed together with the Basic Starting Test in one 30 minute interval; and

(vii) Each Black Start Resource must pass a Line-Energizing Test once every three years.

(c) The “Load-Carrying Test” shall utilize the Load agreed to between ERCOT, TSP and the Black Start Resource. Testing shall occur as conditions permit, at a time agreed on by the Black Start Resource, TSP or DSP, and ERCOT, and includes the following:

(i) Stable operation of the Black Start Resource (in both frequency and voltage) while supplying restoration power to Load that is not identified as auxiliary Load of the Resource and is allowed to be auxiliary Load of adjacent facilities;

(ii) Conducting a Basic Starting Test;

(iii) Conducting a Line-Energizing Test when required;

(iv) Under the direction of ERCOT or the TSP operator, the Black Start Resource shall demonstrate the Black Start Resource’s capability to supply the required Load, while maintaining voltage and frequency for at least 30 minutes;

(v) This test may be performed together with the Basic Starting Test and Line Energizing Test when required in one 30 minute interval; and

(vi) Qualification under the Load-Carrying Test is valid for five years.

(d) “Next Start Resource Test”:

(i) The ability of a Black Start Resource to start up the next start unit’s largest required motor while continuing to remain stable and control voltage and frequency shall be tested. This test shall be repeated when a new next start unit is selected;

(ii) To pass the test:

(A) The potential Black Start Resource must start the next start unit (as determined by ERCOT), or start the next start unit’s largest required motor and satisfied the next start unit’s minimum startup Load requirements; or

(B) The Resource Entity shall demonstrate to the satisfaction of ERCOT through simulation studies conducted by the Resource Entity or a qualified third party, that the potential Black Start Resource is capable of starting the next start unit’s largest required motor while meeting the next start unit’s minimum startup Load requirements.

(iii) Potential Black Start Resources may request from ERCOT the information detailed in paragraph (B) above of the next start unit prior to the satisfaction of this requirement. ERCOT shall request this information from the designated next start unit. Such data, if requested by ERCOT, shall be provided by the QSE or Resource Entity representing the next start unit to ERCOT within 30 days. Such information shall be considered Protected Information by the requesting Resource Entity;

(iv) If a physical test is performed, the test shall commence with a Basic Starting Test, followed by a Line Energizing Test when required and a Load-Carrying Test as a stand-alone test or part of the Next Start Resource Test;

(v) If a physical test is performed, the Black Start Resource must remain stable (in both voltage and frequency) and controlling voltage for 30 minutes;

(vi) If a physical test is performed, this test may be performed together with the Basic Starting Test, Line Energizing Test when required, and Load-Carrying Test in one 30 minute interval; and

(vii) Each Black Start Resource must pass the Next Start Resource Test once every five years.

(4) Each qualified Black Start Resource shall perform a Black Start Resource Availability Test quarterly unless the Black Start Resource has successfully started and operated at LSL or higher for at least four consecutive Settlement Intervals during the quarter. The Black Start Resource’s cost to perform a Black Start Availability Test may be a component of the overall bid for BSS but ERCOT will not separately compensate QSEs representing Black Start Resources for such testing. ERCOT, at its sole discretion, may grant an exemption of the Black Start Resource Availability Test for QSEs whose Black Start Resources have responded as instructed by ERCOT during an EEA event.

(5) The Black Start Resource Availability Test shall be scheduled by ERCOT. Upon receipt of notification for a Black Start Resource Availability Test, the QSE representing the Black Start Resource shall send confirmation to ERCOT of its intent to comply with the test or submit a request to reschedule along with justification for the request.

(6) ERCOT shall provide the QSE representing the Black Start Resource two-hour notice in order to allow the QSE time to update its COP. The QSE representing the Black Start Resource shall show the Resource as “ONTEST” in its COP and through its Real-Time telemetry for the duration of the test. As part of the Black Start Resource Availability Test, the QSE representing the Black Start Resource shall start the Black Start Resource and operate it at or above its LSL for at least four consecutive Settlement Intervals. After completion of the Black Start Resource Availability Test the QSE will update its COP to reflect their current status.

(7) Upon completion of the Black Start Resource Availability Test, the QSE representing the Black Start Resource shall complete and file a Black Start Resource Availability Test report with ERCOT. If the Black Start Resource wants to use a successful start and normal operation to satisfy the quarterly reporting requirement, it must provide the necessary information for the start and normal operation on a Black Start Resource Availability Test report. The report form shall be provided by ERCOT.

(8) A Black Start Resource Availability Test is deemed to be successful if the Black Start Resource comes On-Line within the time specified in the Black Start Resource’s Request for Proposal response submitted to ERCOT and operates at a minimum level as agreed to by ERCOT and the QSE representing the Black Start Resource for at least four consecutive Settlement Intervals.

(9) If the Black Start Resource fails to successfully start during the Black Start Resource Availability Test, the QSE representing the Black Start Resource shall immediately update its Availability Plan for that Black Start Resource showing zero availability. The QSE representing the Black Start Resource shall not receive the Hourly Standby Fee for BSS effective from the date of the failed Black Start Resource Availability Test. The QSE representing the Black Start Resource may schedule a second Black Start Resource Availability Test, subject to ERCOT approval, to be completed within ten Business Days of the date of the failed Black Start Resource Availability Test unless a later date is agreed to by ERCOT. The cost of the second Black Start Resource test will be borne solely by the QSE representing the Black Start Resource.

(10) If the Black Start Resource successfully passes the second Black Start Resource Availability Test, the QSE representing the Black Start Resource shall resume receipt of the Hourly Standby Fee beginning on the date of the successful Black Start Resource Availability Test.

(11) If the Black Start Resource fails a second Black Start Resource Availability Test within the quarter, it shall immediately be disqualified from providing BSS and shall receive no further compensation under the Black Start Service Agreement. In addition, ERCOT shall claw-back all Hourly Standby Fee payments made to the QSE representing the Black Start Resource since its last successful Black Start Resource Availability Test or its last successful start and operation under normal system conditions, whichever is later. The clawed-back Hourly Standby Fee payments shall be uplifted by ERCOT to Loads on a Load Ratio Share (LRS) basis. ERCOT may, at its sole discretion, consider allowing the Black Start Resource to perform an additional Black Start Resource Availability Test. ERCOT may also, at its sole discretion, seek to procure additional Black Start Resources to replace the disqualified Black Start Resource.

(12) A QSE representing the Black Start Resource shall update its Availability Plan for a Black Start Resource to show zero if the Black Start Resource fails to perform when ERCOT has issued a Dispatch Instruction to come On-Line any time other than for a Blackout. The Black Start Resource shall continue to be shown as unavailable until it successfully starts under normal operations or completes a successful Black Start Resource Availability Test.

(13) If the Black Start Resource fails to perform successfully during an actual Blackout and the Black Start Resource has been declared available, as defined in Section 22, Attachment D, ERCOT shall:

(a) Decertify the Black Start Resource for the remainder of the Black Start Agreement contract term, and

(b) Claw-back 100% of the Hourly Standby Fee paid to the QSE representing the Black Start Resource for all the Operating Days since its last successful Black Start Resource Availability Test or its last successful start and operation under normal system conditions, whichever is later.

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| [NPRR863 and NPRR1011: Insert applicable portions of Section 8.1.1.2.1.6 below upon system implementation for NPRR863; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011:]  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.

(2) ERCOT shall continuously measure the overall performance of each QSE in providing each Ancillary Service by comparing the sum of each of the QSE’s Resources’ telemetered Ancillary Services Resource Responsibility with the QSE’s total Ancillary Service responsibility. If the comparison indicates the QSE is not providing sufficient capacity to meet its Ancillary Services responsibility, ERCOT shall notify the QSE via the MIS Certified Area.

(3) The QSE, within ten minutes of receiving the insufficient capacity notification from ERCOT, the QSE must:

(a) If due to a telemetry issue, correct the telemetered Ancillary Services Resource Responsibility to provide sufficient capacity; or

(b) Must provide both appropriate justification for not satisfying their Ancillary Service Obligation and a plan to correct the shortfall that is acceptable with the ERCOT operator. ERCOT shall report non-compliance of Ancillary Service capacity requirements to the Reliability Monitor for review.

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| [NPRR1011: Delete paragraphs (2) and (3) above upon system implementation of the Real-Time Co-Optimization (RTC) project.] |

**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 with REG status, the actual generation or Load, the Ancillary Service Schedule for Reg-Up and Reg-Down, the HSL, the LSL, ramp rates, any other commitments of Ancillary Service capacity.

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| [NPRR1011: Replace paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]  (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 capability 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 providing RRS capacity, actual generation or Load, the Ancillary Service Schedule for RRS, the HSL, the LSL, and any other commitments of Ancillary Service capacity.

(2) For Load Resources not deployed by a Dispatch Instruction from ERCOT, 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 ONRR is considered to be providing frequency responsive capability to the extent that it is not using that capacity to provide energy.

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| [NPRR1011: Replace Section 8.1.1.3.2 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]  **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 capability 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 Resources excluding non-Controllable Load Resources providing FFR, for the RRS capability 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 capability 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 providing Non-Spin capacity, the actual generation, or Load, the Ancillary Service Schedule for Non-Spin, the HSL/Maximum Power Consumption (MPC), the LSL/Low Power Consumption (LPC), ramp rates, and any other commitments of Ancillary Service capacity. ERCOT shall also monitor Non-Spin provided on Resources with OFFNS status.

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| [NPRR1011: Replace paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]  (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 capability 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 and NPRR1011: Insert applicable portions of Section 8.1.1.3.4 below upon system implementation for NPRR863; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011:]  **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 capability 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 Ancillary Service and Energy Deployment Compliance Criteria**

(1) ERCOT shall measure the performance of each Resource in providing Ancillary Services and energy in response to Dispatch Instructions according to the requirements in the sections below. Failure to meet these requirements will be reported to the Reliability Monitor as non-compliance.

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

(1) ERCOT shall limit the deployment of Regulation Service of each QSE for each LFC cycle equal to 125% of the total amount of Regulation Service in the ERCOT System divided by the number of control cycles in five minutes.

(2) For those Resources that do not have a Resource Status of ONDSR or ONDSRREG or Intermittent Renewable Resource (IRR) Groups with no member IRR having a status of ONDSR or ONDSRREG, ERCOT shall compute the GREDP for each Generation Resource that is On-Line and released to SCED 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 or ONDSRREG as follows:

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

**GREDP (MW) = ABS(ATG – AEPFR – ABP - ARI)**

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

ARI = Average Regulation Instruction = the amount of regulation that the Generation Resource or IRR Group should have produced based on the LFC deployment signals, calculated by LFC, during each 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, or Generation Resources that have been approved to telemeter Non-Frequency Responsive Capacity (NFRC), the HSL will be reduced by the telemetered NFRC MW to calculate the EPFR. For Combined Cycle Generation Resources, 5.78% Governor droop shall be used. The Resource-specific calculations will be aggregated for IRR Groups.

ABP = Average Base Point = the time-weighted average of a linearly ramped Base Point or sum of Base Points for IRR Groups, for the five-minute clock interval. The linearly ramped Base Point is calculated every four seconds such that it ramps from its initial value to the SCED Base Point over a five-minute period. The initial value of the linearly ramped Base Point will be the four-second value of the previous linearly ramped Base Point at the time the new SCED Base Point is received into the ERCOT Energy Management System (EMS). In the event that the SCED Base Point is received after the five-minute ramp period, the linearly ramped Base Point will continue at a constant value equal to the ending four-second value of the five-minute ramp.

(3) For all of a QSE’s Resources that have a Resource Status of ONDSR or ONDSRREG (“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*DBPOS + Intra-QSE Purchase – Intra-QSE Sale – ARRDDSRLR – ANSDDSRLR – ∑*DSR* AEPFR) / (ATDSRL + ∑*DSR* ARI) – 1.0] \* 100**

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

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

∑*DSR*ARI = Sum of Average Regulation Instruction 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 or ONDSRREG of the QSE for the five-minute clock interval

∑*DSR*DBPOS = Sum of the difference between a linearly ramped Base Point minus Output Schedule for all Resources with a Resource Status of ONDSR or ONDSRREG of the QSE for the five-minute clock interval. The linearly ramped Base Point is calculated every four seconds such that it ramps from its initial value to the SCED Base Point over a five minute period

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

(4) For Controllable Load Resources that have a Resource Status of ONRGL or ONCLR, ERCOT shall compute the CLREDP. The CLREDP will be calculated both as a percentage and in MWs as follows:

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

**CLREDP (MW) = ABS(ATPC – (ABP – AEPFR – ARI))**

Where:

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

ARI = Average Regulation Instruction = the amount of regulation that the Controllable Load Resource should have produced based on the LFC deployment signals, calculated by LFC, during each five-minute clock interval. Reg-Up is considered a positive value for this calculation

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

ABP = Average Base Point = the time-weighted average of a linearly ramped Base Point for the five-minute clock interval. The linearly ramped Base Point is calculated every four seconds such that it ramps from its initial value to the SCED Base Point over a five-minute period. The initial value of the linearly ramped Base Point will be the four second value of the previous linearly ramped Base Point at the time the new SCED Base Point is received into the ERCOT EMS. In the event that the SCED Base Point is received after the five minute ramp period, the linearly ramped Base Point will continue at a constant value equal to the ending four second value of the five-minute ramp.

(5) 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 either ONRGL or ONCLR;

(c) The percentage of the monthly five-minute clock intervals during which the Generation Resource, IRR or Controllable Load Resource was providing 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 either ONRGL or ONCLR 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 either ONRGL or ONCLR 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 either ONRGL or ONCLR 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 either ONRGL or ONCLR 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 either ONRGL or ONCLR 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 either ONRGL or ONCLR 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 providing 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 providing 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 providing 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 providing 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 providing 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 providing 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 providing 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 providing 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 providing 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 providing 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 providing Regulation Service that the CLREDP was greater than 5.0 MW.

(6) 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:

(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 or ONDSRREG;

(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:

(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 ABP 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.

(7) 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:

(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.

(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 or ONDSRREG 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.

(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.

(8) 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.

(9) 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:

(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.

(10) The GREDP/CLREDP performance criteria in paragraphs (7) through (9) 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 ERCOT website no later than three Business Days after TAC approval.

(11) 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, as described in Section 6.5.7.2, Resource Limit Calculator. The requesting QSE shall provide to the Reliability Monitor information validating the ramp rate violation for the intervals in dispute.

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| [NPRR863, NPRR879, NPRR963, NPRR965, NPRR1000, NPRR1011, NPRR1014, and NPRR1029: Replace applicable portions of Section 8.1.1.4.1 above with the following upon system implementation for NPRR863, NPRR879, NPRR963, NPRR965, NPRR1000, NPRR1014, or NPRR1029; upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011; or upon system implementation of NPRR1000 for NPRR1046:]  **8.1.1.4.1 Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance**  (1) 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 Resource’s Updated Desired Set Point (UDSP) for the five-minute clock interval  (2) 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  (3) 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[((ATPF – AEPFR)/(ASP)) – 1.0] \* 100**  **ESREDP (MW) = ABS(ATPF – AEPFR – ASP)**  Where:  ATPF = Average Telemetered Power Flow = the average telemetered power flow of the Energy Storage Resource for the five-minute clock interval.  ASP = Average Set Point = the time-weighted average of UDSP, 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) \* ABS(HSL-LSL) \* -1, if not then if ∆frequency < zero, EPFR = (∆frequency + Governor Dead-Band)/((droop value \* 60) – Governor Dead-Band) \* ABS(HSL-LSL) \* -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), Resource LSL (MW), 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, 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 or the IRR Group 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/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 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;  (d) 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;  (e) The five-minute clock intervals where the telemetered Resource Status is set to STARTUP;  (f) The five-minute clock intervals where a Generation Resource’s ASP is below the average telemetered LSL;  (g) Certain other periods of abnormal operations as determined by ERCOT in its sole discretion;  (h) 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; and  (i) 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 an ESR, excluding IRRs, 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, 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) 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 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 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, 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.  (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.  (10) DC-Coupled Resources shall meet the following ESREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:  (a) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (1) of Section 3.8.7, DC-Coupled Resources, the DC-Coupled Resource 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 for the DC-Coupled Resource was calculated.  (b) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (2) of Section 3.8.7, the DC-Coupled Resource must have an ESREDP 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 DC-Coupled Resource received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the DC-Coupled Resource’s HSL used by SCED. The expected MW output includes the Resource’s Base Point and any expected Primary Frequency Response.  (c) Additionally, all DC-Coupled Resources will be measured for performance during intervals in which ERCOT has declared an EEA. These Resources must meet the following ESREDP criteria for the time window that includes all five-minute clock intervals during which the EEA was declared. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:  (i) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (1) of Section 3.8.7, the DC-Coupled Resource must have an ESREDP less than the greater of V% or W MW. A DC-Coupled Resource 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.  (ii) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (2) of Section 3.8.7, the DC-Coupled Resource must have a ESREDP less than Z% or the ATG must be less than the expected MW output. A DC-Coupled Resource cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and the DC-Coupled Resource received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the DC-Coupled Resource’s HSL used by SCED. The performance will be measured separately for each instance in which ERCOT has declared EEA.  (11) The GREDP/CLREDP/ESREDP performance criteria in paragraphs (6) through (10) 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 ERCOT website no later than three Business Days after TAC approval.  (12) 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) Each QSE providing RRS shall so indicate by appropriate entries in the Resource’s Ancillary Service Schedule and the Ancillary Service Resource Responsibility providing that service. When manually deployed as specified in Nodal Operating Guide Section 4.8, Responsive Reserve Service During Scarcity Conditions, SCED shall adjust the Generation Resource’s Base Point for any requested RRS energy in the next cycle of SCED as specified in Section 6.5.7.6.2.2, Deployment of Responsive Reserve Service. For Controllable Load Resources, the QSE shall control its Resources to operate to the Resource’s Scheduled Power Consumption minus any Ancillary Service deployments. 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) Within one minute following a deployment instruction, the QSE must update the telemetered Ancillary Service Schedule for RRS for Generation Resources and Load Resources to reflect the deployment amount. The difference between the sum of the QSE’s Resource RRS schedules and the sum of the QSE’s Resource RRS responsibilities must be equal to the QSE’s total RRS deployment instruction, excluding the deployment to Load Resources which are not Controllable Load Resources.

(b) A QSE providing RRS must reserve sufficient Primary Frequency Response capable capacity on each Generation Resource with a RRS responsibility or must reserve sufficient capacity capable of FFR to supply the full amount of RRS scheduled for that Resource. The QSE shall not use NFRC, such as power augmentation capacity on a Generation Resource, to provide RRS.

(c) 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 a RRS responsibility 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 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 Responsibility for RRS from non-Controllable Load Resources; or

(ii) The requested MW deployment.

The QSE’s portfolio shall maintain this response until recalled or the Resource’s obligation to provide RRS expires. The combination of the QSE’s RRS responsibility and additional available capacity shall not exceed 150% of the sum of the QSE’s Ancillary Service Resource Responsibility for RRS from non-Controllable Load Resources. Any additional available capacity from Load Resources other than Controllable Load Resources shall be deployed concurrently with RRS.

(5) 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.

(6) A Load Resource providing RRS excluding Controllable Load Resources must return to at least 95% of its Ancillary Service Resource Responsibility for RRS within three hours following a recall instruction unless replaced by another Resource as described below. However, the Load Resource should attempt to return to at least 95% of its Ancillary Service Resource Responsibility for RRS as soon as practical considering process constraints. For a Load Resource that is not a Controllable Load Resource that is unable to return to its Ancillary Service Resource Responsibility within three hours of recall instruction, its QSE may replace the quantity of deficient RRS capacity within that same three hours using other Generation Resources or other Load Resources not previously committed to provide RRS.

(7) 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.

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| [NPRR863 and NPRR1011: Replace applicable portions of Section 8.1.1.4.2 above with the following upon system implementation for NPRR863; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011:]  **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 Primary Frequency Response 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. After the recall of a Non-Spin Dispatch Instruction, any Generation Resource previously Off-Line providing Non-Spin is allowed to remain On-Line for 30 minutes following the recall. During that time period, the On-Line Generation Resource is treated as if the Non-Spin is being provided.

(3) Control performance during periods in which ERCOT has 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) Within 20 minutes following a deployment instruction, the QSE must update the telemetered Ancillary Service Schedule for Non-Spin for Generation Resources and Controllable Load Resources to reflect the deployment amount.

(b) 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.

(c) 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.

(d) Controllable Load Resources must be available to SCED, and within 25 minutes following a deployment instruction 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.

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| [NPRR1011: Replace Section 8.1.1.4.3 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]  **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, Non-Spinning Reserve Capacity Monitoring Criteria, whichever occurs first. |

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| [NPRR863 and NPRR1011: Insert applicable portions of Section 8.1.1.4.4 below upon system implementation for NPRR863; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011:]  **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, by Operating Hour, of valid COP failures to meet the provisions of paragraphs (3) and (4) of Section 3.9.2, Current Operating Plan Validation, for Ancillary Service Resource Responsibilities contained in the QSE’s COP used for the DRUC and each HRUC during the Operating Day. QSEs shall have no more than three hours during an Operating Day or 74 hours during a month that contains COP Ancillary Service Resource Responsibility validation failures.

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| [NPRR1011: Delete paragraph (2) above upon system implementation of the Real-Time Co-Optimization (RTC) project and renumber accordingly.] |

(3) 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.

(4) 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.

***8.1.3 Emergency Response Service Performance and Testing***

(1) Performance metrics for Emergency Response Service (ERS) event performance, availability, and testing are detailed in this section for both ERS Loads and ERS Generators.

**8.1.3.1 Performance Criteria for Emergency Response Service Resources**

(1) ERS Resources’ compliance will be based on their performance during ERS deployment event(s), their performance in ERS testing, and their availability during an ERS Contract Period. The performance evaluation has three purposes:

(a) To provide the QSE a basis for determining the ERS Resource’s offer capacity;

(b) To provide the basis for ERCOT to determine the ERS Resource’s availability during its committed hours in an ERS Contract Period; and

(c) To measure and verify the ERS Resource’s performance, as compared to its contracted capacity, during an ERS deployment event or test.

**8.1.3.1.1 Baselines for Emergency Response Service Loads**

(1) As part of the ERS procurement process, ERCOT shall notify QSEs of an ERS Load’s eligibility to be evaluated on one or more of the following baselines, which are developed and administered by ERCOT consistent with the North American Energy Standards Board (NAESB) Practice Standards:

(a) The “ERS Default Baseline” requires an ERS Load to reduce its Load by its contracted amount, and is a method of estimating the electricity that would have been consumed by an ERS Load in the absence of an ERS deployment event;

(b) The “ERS Alternate Baseline” requires an ERS Load to reduce Load to a contracted level of electricity Demand (its maximum base load) in an ERS deployment event.

(2) ERS Default Baseline:

(a) As part of its Resource identification process, ERCOT will determine if each ERS Load can qualify under a default baseline methodology. A default baseline methodology is designed to predict the interval Load based on variables which may include historic Load data, weather, time of day and other relevant calendar information. ERCOT may use other data variables in a default baseline methodology at ERCOT’s sole discretion, if ERCOT determines the additional data will enhance the accuracy of the default baseline. Development of a default baseline for each ERS Load will be consistent with practices described in the document entitled “Demand Response Baseline Methodologies” posted on the ERCOT website.

(b) For aggregated ERS Loads, ERCOT may develop either a single baseline model at the aggregate level or multiple baseline models for individual sites and/or subsets of sites within the aggregation. If ERCOT develops the model at the site and/or subset level, ERCOT shall establish the default baseline for the aggregated ERS Load by summing the baselines of the individual sites and/or subsets of sites in the aggregation. ERCOT shall verify the performance at the ERS Load level.

(c) ERCOT will develop a default baseline for an ERS Load by analyzing historic 15-minute interval usage data.

(d) If ERCOT determines that an ERS Load qualifies for a default baseline, ERCOT shall provide default baseline analysis results for the ERS Load to the QSE representing that ERS Resource.

(3) ERS Alternate Baseline:

(a) ERCOT may assign an ERS Load to an alternate baseline formula for one of the following reasons:

(i) ERCOT determines that the ERS Load does not have sufficient predictability for a default baseline;

(ii) The QSE requests an alternate baseline for the ERS Load; or

(iii) ERCOT has insufficient historical meter data available at the time of baseline evaluation to accurately model the ERS Load.

(b) If, following ERS procurement, ERCOT determines that sufficient historical data is available and the ERS Load has sufficient predictability for a default baseline, ERCOT with the QSE’s consent may reassign the ERS Load to a default baseline, notify the QSE of the reassignment, and calculate performance for the ERS Contract Period accordingly.

(c) Under the alternate baseline formula, ERCOT shall calculate an ERS Load’s average (mean) Load (MWh) over the most recent available 12-month period, with an emphasis on the months corresponding to the upcoming ERS Standard Contract Term. ERCOT will validate the MW capacity offer for each ERS Load for the applicable ERS Time Period, based upon the difference between this average Load calculation (MWh) and the ERS Load’s declared maximum base Load (MWh). In selecting an ERS Load with an alternate baseline, ERCOT may award the lesser of the MW offer or the MW capacity validated by ERCOT.

(4) ERS Weather-Sensitive Load:

(a) ERCOT shall assign a residential Weather-Sensitive ERS Load to either the regression baseline performance evaluation methodology or the control group baseline performance evaluation methodology. Both methodologies are described in the document entitled “Demand Response Baseline Methodologies” posted to the ERCOT website. The control group baseline performance evaluation methodology shall only be available to ERS Loads consisting entirely of residential sites.

(i) At least nine months of interval data for all sites within an ERS Load are required for the Load to be eligible for the regression baseline evaluation methodology. If one or more sites lack sufficient interval data, the ERS Load will either be evaluated using the control group baseline performance evaluation methodology or will be disqualified from participation as an ERS Load.

(ii) Sites in an ERS Load assigned to the control group baseline are required to have fully functional interval metering in place at the start of an ERS Standard Contract Term, but are not required to have historical meter data prior to that time.

(iii) If ERCOT determines that the residential ERS Load may be assigned to either baseline methodology, the QSE may select its preferred option.

(b) If the ERS Load consists of non-residential sites, the ERS Load must qualify for at least one ERS default baseline methodology, as described in paragraph (2) above.

(c) For an ERS Load assigned to the control group baseline, ERCOT will divide the aggregation into multiple randomly assigned numbered groups for purposes of testing and deployment event Dispatch, and one of these groups will be designated as the control group, to be held out of the test or event, at time of Dispatch. All remaining ERS Loads will participate and be evaluated in each test or event relative to the control group. ERCOT will strive to minimize control group size while preserving the ability to achieve accurate Demand response measurement and verification. The number of groups, group size and group designations are subject to change if the QSE adjusts the population of the ERS Load during the ERS Standard Contract Term, as described in paragraph (15) of Section 3.14.3.1, Emergency Response Service Procurement.

(5) All ESI IDs within an aggregated ERS Load must be on the same baseline methodology (either the ERS Default Baseline, or the ERS Alternate Baseline).

**8.1.3.1.2 Performance Evaluation for Emergency Response Service Generators**

(1) ERCOT shall evaluate the event performance of an ERS Generator by measuring net injection of energy to the ERCOT System using data from metering as described in paragraph (5)(a) of Section 3.14.3.3, Emergency Response Service Provision and Technical Requirements.

(2) A Non-Weather-Sensitive ERS Load will be classified as co-located with an ERS Generator if each site in the ERS Load is physically located with a site in the ERS Generator, and if both the ERS Generator and the ERS Load are represented by the same QSE and are participating in the same ERS service type and Time Periods. If separate offers are received from different QSEs, both offers will be rejected. A Weather-Sensitive ERS Load is not eligible to be classified as co-located with an ERS Generator.

(3) If an ERS Generator is co-located with an ERS Load the following shall apply:

(a) If the QSE opts for separate evaluation, then, for purposes of determining ERS performance, the injection capacity used to measure performance in each ERS Time Period for the ERS Generator shall be deemed to be the sum of self-serve capacity and injection capacity submitted on the offer for that ERS Time Period and the self-serve capacity used to measure performance for that ERS Time Period shall be deemed to be zero.

(b) If the QSE opts for joint evaluation, then, for purposes of determining ERS performance, the self-serve capacity used to measure performance in each ERS Time Period for the ERS Generator shall be deemed to be the lesser of the self-serve capacity specified on the offer or the peak Load of the ERS Load during that ERS Time Period over the 12 months preceding the beginning of the ERS Standard Contract Term.

(c) If the co-located ERS Load is on an ERS Default Baseline, the event and test performance of the ERS Generator and ERS Load shall be evaluated jointly using interval data from the Transmission and/or Distribution Service Provider (TDSP) installed metering. The joint performance will be attributed to both the ERS Load and ERS Generator.

(d) If the co-located ERS Load is assigned to the ERS Alternate Baseline, the performance shall be evaluated using one of two methods selected by the QSE:

(i) The QSE may elect to have the performance of the ERS Generator and ERS Load evaluated separately. In this case all site Load must participate in the ERS Load and ERCOT shall calculate interval-by-interval values for the Load of each site in the ERS Load by adding the respective intervals of the QSE installed sub-metering on the output of the generator(s) at the site to the imported MWh registered on the TDSP meter and subtracting the MWh exported to the ERCOT Transmission Grid as registered on the TDSP metering. The performance of the ERS Load shall be evaluated using the ERCOT calculated values of the site Load, and the ERS Generator shall be evaluated using the sub-metering installed on each generator to directly measure the output of those generators.

(ii) The QSE may elect to have the performance of the ERS Generator and ERS Load evaluated jointly. In this case, ERCOT shall use the TDSP metering installed for the performance evaluation.

(A) If ERCOT determines that one of its established default baseline types accurately represents the ERS Load’s Demand response contribution, the contribution of the ERS Load to the joint performance shall be based on that response.

(B) If ERCOT determines that none of its established default baseline types accurately represents the ERS Load’s Demand response contribution, the contribution of the ERS Load to the joint performance shall be deemed to be the product of the ERS Load’s obligation for the interval and the ERS Interval Performance Factor (EIPF*i*) as computed in Section 8.1.3.1.4, Event Performance Criteria for Emergency Response Service Resources.

(C) The joint performance will be attributed to both the ERS Load and ERS Generator.

(4) If the ERS Generator is not co-located with an ERS Load the following shall apply:

(a) For purposes of determining ERS performance, the self-serve capacity used to measure performance in each time period for the ERS Generator shall be deemed to be zero and the injection capacity used to measure performance shall be equal to the amount submitted on the offer.

(b) The ERS Generator shall have its performance based on its metered output to the ERCOT System as measured by the TDSP metering.

**8.1.3.1.3 Availability Criteria for Emergency Response Service Resources**

(1) No later than 45 days after the end of an ERS Standard Contract Term, ERCOT shall provide each QSE representing ERS Resources with an availability report for its ERS portfolio for each ERS service type. The report shall contain:

(a) For each ERS Time Period and each ERS Contract Period in the ERS Standard Contract Term, the ERS availability factor (ERSAF) for each ERS Resource in the QSE’s ERS portfolio, as described in Sections 8.1.3.1.3.1, Time Period Availability Calculations for Emergency Response Service Loads, and 8.1.3.1.3.2, Time Period Availability Calculations for Emergency Response Service Generators.

(b) For each ERS Contract Period in the ERS Standard Contract Term, the QSE’s portfolio-level availability factor, as described in Section 8.1.3.3, Payment Reductions and Suspension of Qualification of Emergency Response Service Resources and/or their Qualified Scheduling Entities.

(c) The QSE’s portfolio-level availability factor for the Standard Contract Term, as described in Section 8.1.3.3.

8.1.3.1.3.1 Time Period Availability Calculations for Emergency Response Service Loads

(1) For an ERS Load on an ERS Default Baseline, ERCOT will calculate its ERSAF as follows:

(a) ERCOT will consider the ERS Load to have been unavailable for a 15-minute interval in a contracted ERS Time Period in which any of the following apply:

(i) The interval Load of the ERS Load was less than 95% of its contracted ERS MW capacity;

(ii) The ERS Load’s QSE notified ERCOT, in a format prescribed by ERCOT, of the ERS Load’s unavailability less than three calendar days in advance; or

(iii) The ERS Load’s QSE notified ERCOT, in a format prescribed by ERCOT, of the ERS Load’s unavailability at least three calendar days in advance, but the interval is one for which the unavailability is disallowed as a result of unavailability exceeding 2% of the total contracted 15-minute intervals in the ERS Contract Period.

(b) Otherwise, the ERS Load will be considered available for that 15-minute interval. The ERSAF will be the ratio of the number of 15-minute intervals the ERS Load was available during the ERS Time Period divided by the total number of 15-minute intervals in the ERS Time Period.

(c) Notwithstanding the foregoing, in determining the ERSAF, ERCOT will exclude from the calculation the following contracted intervals:

(i) Any 15-minute interval for which the ERS Load’s QSE notified ERCOT, in a format prescribed by ERCOT, of the ERS Load’s unavailability at least three calendar days in advance, up to a maximum of 2% of the total contracted 15-minute interval in the ERS Contract Period;

(ii) Any 15-minute interval in which the ERS Load was deployed during an EEA, including intervals that begin during the ten-hour ERS recovery period following the issuance of the recall instruction;

(iii) Any 15-minute interval in which the ERS Load was deployed for an ERCOT unannounced test, and including intervals that begin during the full ten-hour ERS recovery period, if applicable; and

(iv) Any 15-minute interval following an ERS deployment resulting in exhaustion of the ERS Load’s obligation in an ERS Contract Period.

(2) For an ERS Load assigned to the alternate baseline, ERCOT will calculate its ERSAF for an ERS Time Period using the following formula:

**ERSAF** ***qce(tp)d* = MIN (1, (AV *qce(tp)d*/ (OFFERMW *qce(tp)d*)))**

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| AV *qce(tp)d* | MW | Average MW Load, calculated as the average of the actual interval MW values or the MW values determined in accordance with paragraphs (a), (b), and (c) below, per 15-minute interval for an ERS Load in a contracted ERS Time Period per ERS service type *d*, excluding declared maximum base Load. |
| OFFERMW *qce(tp)d* | MW | An ERS Load’s contracted capacity for an ERS Time Period, per ERS service type *d*, applicable to either competitively procured or self-provided ERS. |
| ERSAF *qce(tp)d* | None | Availability factor for an ERS Load for an ERS Time Period per ERS service type *d*. |
| *q* | None | A QSE. |
| *c* | None | ERS Contract Period. |
| *e* | None | An ERS Load. |
| *tp* | None | ERS Time Period. |
| *d* | None | ERS service type (Weather-Sensitive ERS-10, Non-Weather-Sensitive ERS-10, Weather -Sensitive ERS-30, or Non-Weather-Sensitive ERS-30). |

(a) If the ERS Load is co-located with an ERS Generator and the QSE has opted for separate evaluation, its Load, for purposes of availability calculations, shall be determined as specified in paragraph (3)(d) of Section 8.1.3.1.2, Performance Evaluation for Emergency Response Service Generators.

(b) For purposes of calculating availability, the interval MW value will be deemed to be equal to the declared maximum base Load if either of the following conditions are met:

(i) The ERS Load’s QSE notified ERCOT, in a format prescribed by ERCOT, of the ERS Load’s unavailability less than three calendar days in advance; or

(ii) The ERS Load’s QSE notified ERCOT, in a format prescribed by ERCOT, of the ERS Load’s unavailability at least three calendar days in advance, but the interval is one for which the unavailability is disallowed as a result of unavailability exceeding 2% of the total contracted 15-minute intervals in the ERS Contract Period.

(c) For purposes of calculating availability, ERCOT shall exclude from the average any 15-minute interval meeting one or more of the following descriptions:

(i) Any 15-minute interval for which the ERS Load’s QSE notified ERCOT, in a format prescribed by ERCOT, of the ERS Load’s unavailability at least three calendar days in advance, up to a maximum of 2% of the total contracted 15-minute interval in the ERS Contract Period;

(ii) Any 15-minute interval in which the ERS Load was deployed during an EEA event, including intervals that begin during the ten-hour ERS recovery period following the issuance of the recall instruction;

(iii) Any 15-minute interval in which the ERS Load was deployed for an ERCOT unannounced test, and including intervals that begin during the full ten-hour ERS recovery period, if applicable; and

(iv) Any 15-minute interval following the ERS deployment resulting in exhaustion of the ERS Load’s obligation in an ERS Contract Period.

(3) A Weather-Sensitive ERS Load shall always have its availability factor for an ERS Contract Period set to 1.0 and its availability settlement weighting factor (ERSAFWT) set to zero.

8.1.3.1.3.2 Time Period Availability Calculations for Emergency Response Service Generators

(1) In order to support ERCOT’s evaluation of ERS Generator availability, QSEs representing ERS Generators may submit to ERCOT no later than two Business Days prior to the start of an ERS Standard Contract Term, in a format determined by ERCOT, the following information:

(a) A schedule of planned maintenance, which includes start and stop times for any planned maintenance events during the four-month ERS Standard Contract Term. A QSE may modify the planned maintenance schedule during an ERS Contract Period by submitting a revision. A revision to a planned maintenance schedule may be submitted no later than three calendar days prior to the start date of the planned maintenance. A revision to a planned maintenance schedule may decrease but may not increase the total duration of planned maintenance.

(b) A self-test schedule, which includes start and stop times and intended output of energy for each scheduled test of the ERS Generator during the ERS Standard Contract Term. A QSE may modify the self-test schedule during an ERS Contract Period by submitting a revision. A revision to a self-test schedule may be submitted no later than three calendar days prior to the date of the change. A revision to a self-test schedule may decrease the number of scheduled tests but may not increase the number of scheduled tests.

(i) Self-tests may be conducted using Load banks. This provision does not apply to ERCOT unannounced tests.

(2) ERCOT shall evaluate the availability of an ERS Generator by using data from 15-minute interval metering dedicated to the ERS Generator. If, pursuant to paragraph (1)(b) above, a QSE elects to submit a self-test schedule to ERCOT, the QSE must install metering that conforms with the requirements described in P.U.C. SUBST. R. 25.142, Submetering for Apartments, Condominiums, and Mobile Home Parks, to measure the output of each site in the ERS Generator. The 15-minute interval data from those meters shall be provided to ERCOT and shall be used for availability evaluation, unless TDSP metered output to the ERCOT System is required to be used for performance evaluation under the provisions of paragraph (4)(b) of Section 8.1.3.1.2, Performance Evaluation for Emergency Response Service Generators.

(3) ERCOT will calculate an ERSAF using interval meter readings for an ERS Generator for each committed ERS Time Period as the ratio of the number of 15-minute intervals the ERS Generator was available in the ERS Time Period divided by the total number of obligated 15-minute intervals in the ERS Time Period. ERS Generators are considered available for any 15-minute interval except the following:

(a) An ERS Generator that is not co-located with an ERS Load will be considered unavailable for all 15-minute intervals that are part of an unsuccessful unannounced ERCOT test or event, as well as any subsequent intervals following the end of the test or event up to the interval immediately preceding the first full 15-minute interval for which the ERS Generator injects energy to the ERCOT System at a level greater than or equal to the sum of its injection capacity and obligation at the time of the test or event. The success or lack of success of an unannounced ERCOT test or event is determined by the criteria specified in Section 8.1.3.2, Testing of Emergency Response Service Resources.

(b) An ERS Generator that is co-located with an ERS Load and is being separately evaluated from the ERS Load will be considered unavailable for all 15-minute intervals that are part of an unsuccessful unannounced ERCOT test or event, as well as any subsequent intervals following the end of the test up to the interval immediately preceding the first full 15-minute interval for which the ERS Generator’s output energy is greater than or equal to the sum of its injection capacity and obligation at the time of the test or event. The success or lack of success of an unannounced ERCOT test or event is determined by the criteria specified in Section 8.1.3.2.

(c) An ERS Generator that is co-located with an ERS Load and is being evaluated jointly with the ERS Load will be considered unavailable for all 15-minute intervals that are part of an unsuccessful unannounced ERCOT test or event, as well as any subsequent intervals following the end of the test up to the interval immediately preceding the first full 15-minute interval for which the combined performance of the ERS Load and ERS Generator is greater than or equal to the combined obligation at the time of the test or event. The success or lack of success of an unannounced ERCOT test or event is determined by the criteria specified in Section 8.1.3.2.

(d) An ERS Generator will be considered unavailable during any 15-minute interval of an obligated ERS Time Period in which any of the following conditions are present:

(i) The ERS Generator output is greater than the sum of its self-serve capacity and its declared injection capacity for the ERS Time Period;

(ii) The export to the grid for the ERS Generator is greater than the injection capacity for the ERS Time Period;

(iii) The ERS Generator performed unsuccessfully for a scheduled self-test, in which case the ERS Generator will be considered unavailable during all 15-minute intervals beginning with the start time the ERS Generator has scheduled for the self-test up to, but not including, the first full 15-minute interval for which the ERS Generator generates at its intended energy output. A scheduled self-test will be deemed unsuccessful if the ERS Generator output remains below its intended output level throughout the entire time scheduled for the self-test; or

(iv) The ERS Generator’s QSE notified ERCOT, in a format prescribed by ERCOT, that the ERS Generator is not available for the interval.

(e) ERCOT shall exclude any 15-minute intervals meeting one or more of the following descriptions from the availability:

(i) Any 15-minute interval of planned maintenance, as described in item (1)(a) above, up to a maximum of 2% of the total contracted 15-minute intervals in the ERS Contract Period;

(ii) Any 15-minute interval in which the ERS Generator was deployed during an EEA event, including intervals that begin during the ten-hour ERS recovery period following the issuance of the recall instruction;

(iii) Any 15-minute interval following an ERS deployment that results in exhaustion of the ERS Generator’s obligation in an ERS Contract Period;

(iv) 15-minute intervals during a successfully completed ERCOT unannounced test of the ERS Generator including intervals that begin during the ten-hour ERS recovery period; and

(v) 15-minute intervals during a successfully completed scheduled self-test, as reported to ERCOT via the provisions in this section.

8.1.3.1.3.3 Contract Period Availability Calculations for Emergency Response Service Resources

(1) ERCOT shall compute a single time- and capacity-weighted availability factor (ERSAFCOMB) for each ERS Resource for an ERS Contract Period from the ERS Time Period ERSAFs calculated in Sections 8.1.3.1.1, Baselines for Emergency Response Service Loads, and 8.1.3.1.3.2, Time Period Availability Calculations for Emergency Response Service Generators, as follows:

**If HOURS *qce(tp)d*= 0, ERSAFCOMB *qced*****= 1**

Otherwise

**ERSAFCOMB *qced*****=**  **(HOURS** *qce(tp)d* **\* OFFERMW *qce(tp)d*** **\*** **ERSAF *qce(tp)d***) /  **(HOURS *qce(tp)d* \* OFFERMW** *q****ce(tp)d***)

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| ERSAFCOMB qced | None | Time- and capacity-weighted availability factor for an ERS Contract Period per ERS service type *d*. |
| HOURS qce(tp)d | Hours | The number of hours an ERS Resource is obligated in an ERS Time Period per ERS service type *d* minus any hours in that Time Period excluded for purposes of computing availability. |
| OFFERMW qce(tp)d | MWh | The ERS Resource’s contracted capacity for that time period per ERS service type *d* expressed in units of MWh. |
| ERSAF qce(tp)d | None | Availability factor for an ERS Resource for an ERS Time Period and per ERS service type *d*. |
| q | None | A QSE. |
| c | None | ERS Contract Period. |
| e | None | Individual ERS Resource. |
| tp | None | ERS Time Period. |
| d | None | ERS service type (Weather-Sensitive ERS-10, Non-Weather-Sensitive ERS-10, Weather -Sensitive ERS-30, or Non-Weather-Sensitive ERS-30). |

(2) In an ERS Contract Period with no ERS deployment events, the ERSAFWT for all ERS Resources shall be set to 1.0.

(3) In an ERS Contract Period with one or more ERS deployment events and in which no ERS Resource’s ERS obligation is exhausted, the ERSAFWT for deployed ERS Resources shall be set to 0.25 and the ERSAFWT for all undeployed ERS Resources shall be set to 1.0.

(4) In an ERS Contract Period in which one or more ERS Resources’ ERS obligation are exhausted, or one or more ERS Resources have discontinued participation in one or more ERS Time Periods because the ERS Resource was selected to provide service as an MRA, the following shall apply:

(a) For all deployed ERS Resources, the ERSAFWT of the exhausted or discontinued ERS Resource shall be set to 0.25 × ERSAFHRS*qced* with ERSAFHRS determined as calculated paragraph (c) below.

(b) For all ERS Resources with no deployments during the ERS Contract Period, ERSAFWT shall be set to 1.0.

(c) ERSAFHRS for the ERS Contract Period shall be calculated using the following formula:

**ERSAFHRS** *qced* ***=*****(AFHOURS***qced* **/** (**AFHOURS***qced* **+**

**HOURS** *qsce(tp)d*)**)**

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| ERSAFHRS *qced* | None | The ratio of Availability Factor Hours to the total Standing Contract Term hours for an ERS Resource per ERS service type *d*. |
| AFHOURS*qced* | Hours | Number of the ERS Resource’s obligated hours prior to the exhaustion of the ERS Resource’s obligation per ERS service type *d*, or discontinuance of an ERS Resource’s participation, minus any hours during that time excluded for purposes of computing availability. |
| HOURS*qsce(tp)d* | Hours | The total number of awarded hours for an ERS Time Period in the ERS Standard Contract Term preceding the beginning of the ERS Contract Period and following the exhaustion of the ERS obligation per ERS service type *d* or discontinuance of an ERS Resource’s participation. |
| *q* | None | A QSE. |
| *s* | None | ERS Standard Contract Term. |
| *c* | None | ERS Contract Period. |
| *e* | None | Individual ERS Resource. |
| *tp* | None | ERS Time Period. |
| *d* | None | ERS service type (Weather-Sensitive ERS-10, Non-Weather-Sensitive ERS-10, Weather -Sensitive ERS-30, or Non-Weather-Sensitive ERS-30). |

(d) An ERS Resource shall be deemed to have met its availability requirements for an ERS Contract Period if ERSAFHRS for the ERS Contract Period is less than 0.5 and if the ERS Resource achieves an ERSAFCOMB greater than or equal to the value calculated in the formula below:

**3.8 \* ERSAFHRS***qced* **– 3.8 \* (ERSAFHRS***qced***)**2

(e) An ERS Resource that is deemed to have met its availability requirements under paragraph (d) above shall have its availability factor for that ERS Contract Period set to 1.0.

**8.1.3.1.4 Event Performance Criteria for Emergency Response Service Resources**

(1) No later than 45 days after the end of an ERS Standard Contract Term in which one or more ERS deployment events occurred, ERCOT shall provide each QSE representing ERS Resources with an event performance report containing the results of ERCOT’s evaluation of the event(s). The report shall contain:

(a) For each event, the ERS event performance factor (ERSEPF) for each ERS Resource in the QSE’s ERS portfolio, as described in this Section;

(b) For each event, the QSE’s portfolio-level event performance factor, as described in Section 8.1.3.3, Payment Reductions and Suspension of Qualification of Emergency Response Service Resources and/or their Qualified Scheduling Entities;

(c) The QSE’s portfolio-level event performance factor for the ERS Standard Contract Term, as described in Section 8.1.3.3.

(2) An ERS Resource’s performance shall not be evaluated for an ERS deployment if one of the following is true:

(a) The QSE has submitted timely notice to ERCOT pursuant to Section 8.1.3.1.3.1, Time Period Availability Calculations for Emergency Response Service Loads, that one or more sites in the ERS Resource are unavailable for the interval that includes the beginning of the Sustained Response Period of the deployment, and that interval is not one that exceeds the 2% maximum specified in that section;

(b) The QSE has submitted timely notice to ERCOT pursuant to Section 8.1.3.1.3.2, Time Period Availability Calculations for Emergency Response Service Generators, that one or more sites in the ERS Resource have scheduled planned maintenance for the interval that includes the beginning of the Sustained Response Period of the deployment, and that interval is not one that exceeds the 2% maximum specified in that section;

(c) The Resource is in a ten-hour recovery period following a prior deployment at the beginning of the sustained response period of the deployment;

(d) The ERS Resource does not have an obligation for at least one full interval during the Sustained Response Period of that event;

(e) For Non-Weather-Sensitive ERS Resources, one or more sites of an ERS Resource were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline. QSEs must provide verification of such events from the TDSP or MRE; or

(f) For Weather-Sensitive ERS Resources, 10% or more sites of an ERS Load were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline.

(3) Otherwise, ERCOT shall evaluate an ERS Resource’s performance during an ERS deployment based on the following criteria:

(a) Within the applicable ramp period, ERS Loads shall curtail Load and ERS Generators shall output energy and reach a level of energy injection to the ERCOT System in accordance with their ERS contractual obligations. The ramp period for ERS Resources in ERS-10 is ten minutes. The ramp period for ERS Resources in ERS-30 is 30 minutes. ERCOT shall assess each ERS Resource’s compliance with this requirement by using the EIPFs, calculated in paragraph (c) below, for the first full interval of the Sustained Response Period.

(b) An ERS Load on a default baseline is expected to not increase its Load during the ramp period prior to an ERS test or deployment event. ERCOT will deem repeated occurrences of such Load increases to be a violation of the Protocols.

(c) ERCOT shall measure each ERS Resource’s performance throughout the duration of an ERS deployment event by analyzing 15-minute interval meter data associated with the ERS Resource. ERCOT will compute an ERSEPF for each ERS Resource based upon this analysis.

(i) The ERSEPF is computed as the time-weighted arithmetic average of the EIPFs for the Sustained Response Period. An EIPF is computed for the ERS Resource for each of the 15-minute intervals in an ERS Sustained Response Period for which the ERS Resource has contracted capacity. If the last interval of the Sustained Response Period has an interval fraction (IntFrac) of less than one, the EIPF for that interval shall be excluded for the computation of ERSEPF. For an interval, EIPF*i* is computed as follows:

**EIPF *i* = Max(Min(((Base\_MWh *i* – Actual\_MWh *i*) / (IntFrac *i* \* OFFERMW)),1),0)**

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| IntFrac *i* | None | Interval fraction for that ERS Resource for that interval. |
| Base\_MWh *i* | MWh | For an ERS Load on a default baseline, the aggregated sum of baseline MWh values estimated by ERCOT for all sites in the ERS Load for that interval.  For an ERS Load assigned to the alternate baseline, the sum of the ERS Load’s OFFERMW and maximum base Load for that interval.  For a stand-alone ERS Generator or an ERS Generator co-located and jointly evaluated with an ERS Load, the net energy injected to the ERCOT System for that interval.  For an ERS Generator co-located with, but evaluated separately from an ERS Load, the energy output of the ERS Generator. |
| Actual\_MWh *i* | MWh | For an ERS Load, the aggregated sum of the actual MWh values for all sites in the ERS Load for that interval.  For an ERS Generator, the ERS Generator’s declared injection capacity, expressed in units of MWh. |
| OFFERMW | MWh | The ERS Resource’s contracted capacity for that interval expressed in units of MWh. |
| *i* | None | An interval. |

and where IntFrac *i* corresponds to the fraction of time for that interval for which the Sustained Response Period is in effect and is computed as follows:

**IntFrac *i*= (CEndT *i* – CBegT *i*) / 15**

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| IntFrac *i* | None | Interval fraction for that ERS Resource for that interval. |
| CBegT *i* | Minutes | If the Sustained Response Period begins after the start of that interval, the time in minutes from the beginning of that interval to the beginning of the Sustained Response Period, otherwise it is zero. |
| CEndT *i* | Minutes | If the Sustained Response Period ends during that interval, the time in minutes from the beginning of that interval to the end of the Sustained Response Period, otherwise it is 15. |
| *i* | None | An interval. |

(ii) For an ERS Load assigned to an alternate baseline, if the IntFrac for the first interval of the Sustained Response Period is less than one, the EIPF for that interval shall be calculated as follows:

(A) If the actual Load of the full 15-minute interval is less than the maximum base Load, the EIPF for that interval shall be set to one.

(B) If the QSE submits interval data for the day of the event that is more granular than at the 15-minute interval level that shows the average Load for the ERS Resource was below its maximum base Load for the portion of the interval in the Sustained Response Period, the EIPF for that interval shall be set to one. This submitted data must be in a format acceptable to ERCOT and include, at a minimum, the actual Load and associated time stamps.

(C) If the QSE submits other documentary evidence that ERCOT determines, in its discretion, demonstrates the average Load for the ERS Resource was below its maximum base Load for the portion of the interval in the Sustained Response Period, the EIPF for that interval shall be set to one. The documentary evidence must be supported by a sworn affidavit.

(D) If none of the above applies, then ERCOT shall calculate EIPF using the formula in subsection (i) above with Base\_MWhi determined using one of the baselines described in the document titled “Demand Response Baseline Methodologies” on ERCOT.com.

(iii) If an ERS deployment event lasts more than eight hours, the time-weighting factor for intervals beyond the eighth hour shall be reduced by 25%.

(iv) In any ERS Standard Contract Term in which ERCOT has deployed ERS, the ERSEPF for an ERS Resource shall be the time-weighted average of the event performance factors for all events for which the ERS Resource was deployed.

(v) Irrespective of its ERSEPF, an ERS Resource shall be deemed to have met its event performance requirements if it is an ERS Load determined by ERCOT to have met its Load reduction obligations in the ERS deployment event if measured on one of ERCOT’s established default baseline types other than the baseline type selected by the QSE, and ERCOT determines that the different baseline more accurately represents the ERS Load’s Demand response contribution.

(4) For an ERS deployment event, ERCOT shall calculate EIPFs and an ERSEPF for a Weather-Sensitive ERS Load, using actual 15-minute interval meter data, or, for Distributed Renewable Generation (DRG) that has been designated by the QSE to be evaluated by using its native load calculated 15-minute interval native load data, consistent with the provisions of paragraph (3)(c)(i) above. No other provisions in paragraph (3) above shall apply to Weather-Sensitive ERS Loads.

(5) Regardless of the number of enrolled sites in the Weather-Sensitive ERS Load at the time of an event or test, the contracted capacity value (OFFERMW) used will be the value submitted by the QSE in its offer.

**8.1.3.2 Testing of Emergency Response Service Resources**

(1) ERCOT may conduct an unannounced test of any ERS Resource at any time during an ERS Time Period in which the ERS Resource is contracted to provide ERS. Prior to the beginning of a Standard Contract Term, a QSE may request that one or more of its ERS Resources awarded in ERS-30 be tested as if subject to a ten-minute ramp during that ERS Standard Contract Term. The duration of a test will not count toward the ERS Resource’s eight hours of maximum deployment time for an ERS Contract Period.

(a) For Non-Weather-Sensitive ERS Resources, ERCOT shall determine a test performance factor for each test using the methodology defined in Section 8.1.3.1.4, Event Performance Criteria for Emergency Response Service Resources.

(i) The test performance factors for Non-Weather-Sensitive ERS Resources resulting from those tests will be used in Settlement for that and subsequent ERS Standard Contract Terms as specified in Section 8.1.3.3, Payment Reductions and Suspension of Qualification of Emergency Response Service Resources and/or their Qualified Scheduling Entities.

(ii) A test shall be deemed to be successful if the ERS Resource achieves both a test performance factor of 0.95 or greater and an EIPF for the full first interval of the test of 0.95 or greater.

(iii) An ERS Resource for which the most recent test with a ten-minute ramp was successful shall not be subject to a test for at least 330 days regardless of whether the ERS Resource is participating in ERS-10 or ERS-30.

(iv) An ERS Resource for which the most recent test with a 30-minute ramp was successful shall not be subject to a test for at least 330 days unless the ERS Resource participates in ERS-10 during that period.

(v) An ERS Resource participating in ERS-10 that meets its performance obligations during any ERS deployment event shall not be subject to a test for at least the following 330 days.

(vi) An ERS Resource participating in ERS-30 that meets its performance obligations during any ERS deployment event shall not be subject to a test for at least the following 330 days unless the ERS Resource participates in ERS-10 during that period.

(vii) Notwithstanding the foregoing:

(A) If ERCOT determines that an ERS Generator failed to perform adequately in one or more scheduled self-tests, ERCOT may re-test that ERS Generator without regard to the 330 day limit specified above.

(B) If the ERSAFCOMB for an ERS Load for an ERS Standard Contract Term consisting of a single ERS Contract Period is less than 0.85, or the ERSAFCOMB for an ERS Load for an ERS Contract Period with a duration that is less than an ERS Standard Contract Term is lower than the threshold specified in paragraph (4)(d) of Section 8.1.3.1.3.3, Contract Period Availability Calculations for Emergency Response Service Resources, ERCOT may re-test that ERS Load without regard to the 330 day limit specified above.

(C) If an ERS Resource is contracted to provide services under an MRA Agreement and has an ERS obligation during an overlapping ERS Standard Contract Term, ERCOT may conduct additional testing to verify the site’s ability to provide both services on the same or consecutive days. Such testing may be conducted without regard to the 330 day limit specified above and without regard to any recovery periods allowed for either ERS or the MRA Agreement.

(b) Testing will be considered void and would require re-testing for any non-weather-sensitive Resources if one or more sites of an ERS Resource were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline. QSEs must provide verification of such events from the TDSP or MRE.

(c) For Weather-Sensitive ERS Resources, ERCOT shall conduct unannounced testing of each Weather-Sensitive ERS Load at least once but no more than twice per month of obligation during an ERS Standard Contract Term, unless testing has been superseded by deployment events as described in paragraph (vii) below.

(i) The tests will be conducted according to normal ERS testing procedures.

(ii) At the time of Dispatch during a test, ERCOT will not advise the QSE of the test duration, which may vary from one full 15-minute interval to 12 full 15-minute intervals.

(iii) ERCOT may conduct a test during any of a Weather-Sensitive ERS Load’s obligated hours. However, tests will generally be targeted toward periods of peak weather conditions.

(iv) For a Weather-Sensitive ERS Load assigned to the control group baseline, for each test ERCOT will designate a single group which shall be removed from the test population that will serve as the control group.

(v) ERCOT shall calculate a test performance factor for each test of a Weather-Sensitive ERS Load using the event performance methodology described in Section 8.1.3.1.4.

(vi) The QSE is responsible for managing group assignments and for deploying only the sites dispatched by ERCOT during a test.

(vii) ERCOT may reduce the number of tests administered by the number of deployment events during the ERS Standard Contract Term.

(viii) The test performance factors for Weather-Sensitive ERS Resources shall always be set to one for use in Settlement for the ERS Standard Contract Term.

(ix) Testing will be considered void for any weather-sensitive Resources if 10% or more sites of a weather-sensitive Resource were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline. QSEs must provide verification of such events from the TDSP or MRE.

(2) ERCOT shall conduct an unannounced test of an ERS Resource that has been suspended from participation in ERS pursuant to Section 8.1.3.3. ERCOT will conduct such a test only after the QSE representing the ERS Resource has communicated to ERCOT a request for reinstatement of the suspended ERS Resource.

(3) An ERCOT unannounced test of an ERS Generator must demonstrate injection of energy to the ERCOT System. The use of Load banks is prohibited for ERCOT unannounced tests.

(4) If an ERS Generator is co-located with an ERS Load as specified in Section 8.1.3.1.2, Performance Evaluation for Emergency Response Service Generators, ERCOT shall test both such ERS Resources simultaneously, and the test performance of the ERS Load and the ERS Generator shall be considered jointly.

(5) In order to assist QSEs and ERS Resources in managing environmental compliance, ERCOT shall limit the cumulative duration of Sustained Response Periods of testing of an ERS Resource to a maximum of one hour per ERS Standard Contract Term unless otherwise required to conduct re-testing.

(6) Notwithstanding paragraph (5) above, Weather-Sensitive ERS Resources shall be subject to testing as described in paragraph (1)(c) above.

**8.1.3.3 Payment Reductions and Suspension of Qualification of Emergency Response Service Resources and/or their Qualified Scheduling Entities**

***8.1.3.3.1 Suspension of Qualification of Non-Weather-Sensitive Emergency Response Service Resources and/or their Qualified Scheduling Entities***

(1) If a QSE’s portfolio-level availability factor and event performance factors as calculated in Section 8.1.3.3.3, Performance Criteria for Qualified Scheduling Entities Representing Non Weather-Sensitive Emergency Response Service Resources, both equal or exceed 0.95, the QSE will be deemed to have met its ERS performance requirements for the ERS Contract Period, and the QSE and its ERS Resources are not subject to suspension.

(2) If a QSE fails to meet its portfolio-level availability and/or event performance requirements as described in Section 8.1.3.3.3, ERCOT shall take the following actions:

(a) If a QSE failure is based only on event performance failure and ERS Resources that comprise 95% or more of the QSE’s obligation for each of the events in the ERS Contract Term are deemed to have met their obligations, the QSE shall be deemed to have met its event performance requirements for the ERS Contract Term; otherwise

(b) ERCOT may suspend the QSE from participation in ERS, and the QSE may be subject to administrative penalties imposed by the Public Utility Commission of Texas (PUCT). ERCOT may consider mitigating factors such as equipment failures and Force Majeure Events in determining whether to suspend the QSE.

(3) If a QSE’s portfolio-level availability factor is less than 0.95 excluding the intervals for Resources that had one or more sites of an ERS Resource disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline, ERS Resources in that portfolio that were not disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline shall be subject to the following:

(a) If an ERS Resource in the QSE’s portfolio achieves an availability factor of 0.85 or greater, the ERS Resource shall not be subject to a reduction of its availability factor;

(b) If an ERS Resource achieves an ERSAFCOMB less than 0.85 for an ERS Standard Contract Term consisting of a single ERS Contract Period, or achieves an ERSAFCOMB lower than the threshold specified in paragraph (4)(d) of Section 8.1.3.1.3.3 for an ERS Contract Period with a duration that is less than an ERS Standard Contract Term, then the ERS Resource’s availability factor shall be squared; and

(c) If the availability factor for one or more ERS Resources is squared pursuant to paragraph (b) above, ERCOT shall compute the QSE’s final portfolio-level availability factor using that modified availability factor.

(4) ERCOT shall calculate a QSE’s portfolio-level event performance factor and interval performance factor for the first full interval of that event. The portfolio for this purpose shall consist of ERS Resources that did not have any sites that were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline. If either the portfolio-level event performance factor or the interval performance factor for the first full interval of the Sustained Response Period is less than 0.95, ERCOT shall determine final event performance factors for ERS Resources in the portfolio as follows:

(a) If an ERS Load in the QSE’s portfolio is not co-located with an ERS Generator or is evaluated separately, as specified in Section 8.1.3.1.2, Performance Evaluation for Emergency Response Service Generators, the final event performance factor for the ERS Load shall be determined as follows:

(i) If the ERS Load achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the final event performance factor shall be set equal to the original event performance factor.

(ii) If the ERS Load achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the baseline for that ERS Load shall be multiplied by a reduction factor that results in the final event performance factor being equal to the square of its original event performance factor.

(iii) If the ERS Load achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the baseline for that ERS Resource shall be multiplied by a reduction factor that results in the final event performance factor being equal to 0.75 times its original event performance factor.

(iv) If the ERS Load achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the baseline for that ERS Resource shall be multiplied by a reduction factor that results in the final event performance factor being equal to 0.75 times the square of its original event performance factor.

(b) If an ERS Generator in the QSE’s portfolio, is not co-located with an ERS Load, the final event performance factor for the ERS Generator shall be determined as follows:

(i) If the ERS Generator achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the final event performance factor shall be set equal to original event performance factor.

(ii) If the ERS Generator achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the net energy injected to the ERCOT System by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final event performance factor being equal to the square of its original event performance factor.

(iii) If the ERS Generator achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the net energy injected to the ERCOT System by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final event performance factor being equal to 0.75 times its original event performance factor.

(iv) If the ERS Generator achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the net energy injected to the ERCOT System by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final event performance factor being equal to 0.75 times the square of its original event performance factor.

(c) If an ERS Generator in the QSE’s portfolio, is co-located with an ERS Load and is evaluated separately, as specified in Section 8.1.3.1.2, the final event performance factor for the ERS Generator shall be determined as follows:

(i) If the ERS Generator achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the final event performance factor shall be set equal to original event performance factor.

(ii) If the ERS Generator achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the energy output by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final event performance factor being equal to the square of its original event performance factor.

(iii) If the ERS Generator achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the energy output by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final event performance factor being equal to 0.75 times its original event performance factor.

(iv) If the ERS Generator achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the energy output by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final event performance factor being equal to 0.75 times the square of its original event performance factor.

(d) If an ERS Load and an ERS Generator in a QSE’s portfolio, are co-located and are evaluated jointly, as specified in Section 8.1.3.1.2, the final event performance factor shall be determined as follows:

(i) If the combined performance of the ERS Load and ERS Generator achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the final event performance factor for both ERS Resources shall be set equal to original event performance factor.

(ii) If the combined performance of the ERS Load and ERS Generator achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of 0.95 or greater, the net energy injected to the ERCOT System by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final combined event performance factor being equal to the square of its original combined event performance factor. If a reduction factor of zero results in the combined event performance factor being greater than the square of the original combined event performance factor, the net energy injected to the ERCOT System shall be set to zero for all intervals in the event and the baseline for the ERS Load shall be multiplied by a reduction factor that results in the final combined event performance factor being equal to the square of the original combined event performance factor.

(iii) If the combined performance of the ERS Load and ERS Generator achieves an event performance factor of 0.95 or greater and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the net energy injected to the ERCOT System by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final combined event performance factor being equal to 0.75 times its original event performance factor. If a reduction factor of zero results in the combined event performance factor being greater than 0.75 times its original event performance factor, the net energy injected to the ERCOT System shall be set to zero for all intervals in the event and the baseline for the ERS Load shall be multiplied by a reduction factor that results in the final combined event performance factor being equal to 0.75 times its original event performance factor.

(iv) If the combined performance of the ERS Load and ERS Generator achieves an event performance factor of less than 0.95 and an interval performance factor for the first full interval of the Sustained Response Period of less than 0.95, the net energy injected to the ERCOT System by the ERS Generator for each interval of the event shall be multiplied by a reduction factor that results in the final combined event performance factor being equal to 0.75 times the square of its original event performance factor. If a reduction factor of zero results in the combined event performance factor being greater than 0.75 times the square of its original event performance factor, the net energy injected to the ERCOT System shall be set to zero for all intervals in the event and the baseline for the ERS Load shall be multiplied by a reduction factor that results in the final combined event performance factor being equal to 0.75 times the square of its original event performance factor.

(e) If the final event performance factor for one or more ERS Resources in a QSE’s portfolio is reduced pursuant to paragraphs (a) through (d) above, ERCOT shall re-compute the QSE’s final portfolio-level event performance factor using each ERS Resource’s final event performance factor.

(5) If an ERS Resource, in accordance with Section 8.1.3.2, Testing of Emergency Response Service Resources, has failed any two consecutive tests in an ERS Standard Contract Term, or has failed both the first test in an ERS Standard Contract Term and the most recent prior test occurring within 365 days of that first failed test, ERSTESTPF shall be set to the lower of 0.75 or the average of those two test performance factors and shall be used in calculating the payment to the QSE for the ERS Standard Contract Term during which the second failure occurred. Otherwise, ERSTESTPF shall be set to 1.0.

(6) Notwithstanding the provisions of paragraph (5) above, if an ERS Resource, in accordance with Section 8.1.3.2, has failed the most recent three consecutive tests within a 365 day period, then ERSTESTPF for the ERS Standard Contract Term in which the most recent failure has occurred, shall be determined as follows:

(a) If the average of ERSTESTPF for those three tests is equal to 0.90 or greater, ERSTESTPF shall be set to 0.5.

(b) If the average of ERSTESTPF for those three tests is less than 0.90, ERSTESTPF shall be set zero.

(c) If the ERS Resource has failed the most recent four consecutive tests within a 365 day period, then ERSTESTPF for the ERS Standard Contract Term in which the most recent failure has occurred, shall be set to zero.

(7) Notwithstanding the provisions of paragraphs (5) and (6) above, if an ERS Resource, in accordance with Section 8.1.3.1.4, Event Performance Criteria for Emergency Response Service Resources, successfully deploys in an ERS event during that ERS Standard Contract Term, ERSTESTPF shall be set to 1.0 for that ERS Standard Contract Term.

(8) If a Governmental Authority issues a written determination that an ERS Resource is in violation of any environmental law that would preclude the ERS Resource’s compliance with its ERS availability or deployment obligations, ERCOT shall treat the ERS Resource as having no availability for the remainder of the Standard Contract Term following the Governmental Authority’s determination and shall treat the Resource as having an event performance factor of zero for any deployments in the remaining portion of the ERS Standard Contract Term.  ERCOT shall also suspend the ERS Resource’s participation in ERS until the ERS Resource’s QSE certifies to ERCOT in writing that the violation has been remedied and that the ERS Resource may lawfully participate in ERS.

(9) If a QSE is suspended pursuant to paragraph (2) above, each of the QSE’s ERS Resources whose availability or event performance factors was reduced in accordance with paragraphs (3) or (4) above also shall be suspended, and each of the sites in those ERS Resources shall also be suspended. The duration of the suspension for such ERS Resources and sites shall be one ERS Standard Contract Term. ERCOT shall reject offers for ERS Resources that are suspended or that contain one or more suspended sites. Notwithstanding the foregoing, ERCOT may choose not to suspend an ERS Resource if it determines that the reduced availability or event performance factor was attributable to the fault of its QSE or to one or more mitigating factors, such as equipment failures and Force Majeure Events.

(10) The suspension of an ERS Resource or a QSE representing an ERS Resource shall begin on the day following the expiration of the current or most recent ERS obligation.

(11) ERCOT may reinstate an ERS Resource’s eligibility to offer into ERS upon the ERS Resource’s satisfactory completion of the reinstatement process, including a test conducted by ERCOT, as described in Section 8.1.3.2 and in the ERS technical requirements.

***8.1.3.3.2 Payment Reduction and Suspension of Qualification of Weather-Sensitive Emergency Response Service Loads and/or their Qualified Scheduling Entities***

(1) If the QSE portfolio-level event performance factor for the QSE’s portfolio of Weather-Sensitive ERS Loads for the ERS Contract Period as calculated in Section 8.1.3.3.4, Performance Criteria for Qualified Scheduling Entities Representing Weather-Sensitive Emergency Response Service Loads, is greater than or equal to 0.90 or if 10% or more sites of an ERS Load were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline, ERCOT shall not impose a payment reduction for any of the those ERS Loads. Otherwise, ERCOT shall compute QSE portfolio-level Demand reduction values for each test and event throughout the ERS Contract Period as the greater of zero or the portfolio-level baseline estimate for each interval less the portfolio-level actual Load for that interval. The relationship of the Demand reduction values for each ERS Load to actual weather shall be modeled and used to derive a time-period specific Demand reduction value that would be realized under normalized peak weather conditions. If the normalized peak Demand reduction value for each ERS Time Period, summed across all ERS Loads in the portfolio is greater than or equal to 90% of the QSE’s total offered MW capacity in that time period, ERCOT shall not impose a payment reduction for any of the ERS Loads in the portfolio.

(2) For an ERS deployment event for a Weather-Sensitive ERS Load with three or more full intervals in the Sustained Response Period, if the ERS Load’s EIPF for the first full interval of the Sustained Response Period is less than 75% of the average EIPF for the remaining full intervals of the Sustained Response Period, the baseline used to evaluate the ERS Load shall be reduced to the level at which the ERSEPF for that event or test is equal to 0.75 times the ERSEPF determined by using the initial baseline.

(3) If the provisions of paragraph (1) above are not met, ERCOT shall reduce a QSE’s payment for Weather-Sensitive ERS Load as follows:

(a) If the maximum number of sites in the ERS Load during the ERS Standard Contract Term is less than 80% of the number of sites projected by the QSE at the time of offer submission, as described in paragraph (15) of Section 3.14.3.1, Emergency Response Service Procurement, the baseline used to evaluate the Weather-Sensitive ERS Load shall be reduced to the level at which the ERSEPF is equal to the square of the ERSEPF determined by using the initial baseline.

(b) For all events occurring in an ERS Time Period, if, for that ERS Time Period the normalized peak Demand reduction value per site within the Weather-Sensitive ERS Load is less than 90% of the average Demand reduction value per site, based on the QSE’s offer for that ERS Time Period, and the ERS Load’s ERSEPF for an event in that ERS Time Period is less than 0.90, the baseline used to evaluate the ERS Load for that event shall be reduced to the level at which the ERS Load’s ERSEPF is equal to the square of the ERSEPF determined by using the initial baseline.

(c) If either paragraph (3)(a) or (b) above require a payment reduction, but not both, and the normalized peak demand reduction for the resource is greater than or equal to 90% of the QSE’s offered MW capacity, no payment reduction for the event shall be imposed.

(d) If the provisions of both paragraphs (3)(a) and (b) above require the ERSEPF to be squared, the baseline used to evaluate the ERS Load shall be reduced to the level at which the ERSEPF for the ERS Load is equal to the cube of the ERSEPF determined by using the initial baseline.

(e) If an ERS Load’s obligation is exhausted during an ERS Contract Period, the provisions of paragraphs (3)(a), (b), and (c) above shall not apply.

(f) Baseline reductions required pursuant to paragraphs (3)(a), (b), and (c) above shall be applied to the initial baseline calculated by ERCOT. If a baseline reduction pursuant to paragraph (2) above also is required, that reduction shall be based on the adjusted baseline after applying the reductions provided for in paragraphs (3)(a), (b), and (c) above.

(g) If the final event performance factor for one or more ERS Loads in a QSE’s portfolio of Weather-Sensitive ERS Loads is reduced pursuant to paragraphs (2) or (3)(a), (b), or (d) above, ERCOT shall re-compute the QSE’s final portfolio-level event performance factor using each ERS Load’s adjusted baselines.

***8.1.3.3.3 Performance Criteria for Qualified Scheduling Entities Representing Non-Weather-Sensitive Emergency Response Service Resources***

(1) A QSE’s ERS performance will be evaluated based on its portfolio’s performance for each of the four ERS service types during ERS deployment events and on the overall availability of its portfolio in an ERS Standard Contract Term, as follows:

(a) Availability:

(i) ERCOT shall calculate a portfolio-level availability factor (ERSAF*qc*) for each QSE’s ERS portfolio for each ERS service type for each ERS Time Period in an ERS Contract Period using the methodologies defined in Section 8.1.3.1.3, Availability Criteria for Emergency Response Service Resources, except that the availability factor for each ERS Time Period will be allowed to exceed 1.0. ERCOT shall then calculate a single time- and capacity-weighted availability factor for the QSE portfolio for each ERS service type for the ERS Contract Period using the methodologies defined in Section 8.1.3.1.3. ERCOT shall then calculate a single time- and capacity-weighted availability factor (ERSAFCOMB*qr*) for the QSE portfolio for the ERS Standard Contract Term, capped at 1.0.

(ii) For an ERS Standard Contract Term with a single ERS Contract Period, the QSE portfolio-level availability factor for the ERS Standard Contract Term shall be the portfolio-level availability factor for the ERS Contract Period. For an ERS Standard Contract Term with multiple ERS Contract Periods, ERCOT shall compute a QSE portfolio-level availability factor for each ERS service type for the ERS Standard Contract Term by averaging the QSE’s availability factors across ERS Contract Periods and ERS Time Periods, weighted according to time and capacity obligations.

(iii) The QSE’s portfolio-level availability factor for each ERS service type for the ERS Standard Contract Term will determine both the availability component of the ERS payment to the QSE and whether the QSE has met its ERS availability requirements. If the QSE’s portfolio-level availability factor for each ERS service type for the ERS Standard Contract Term equals or exceeds 0.95, the QSE shall be deemed to have met its availability requirements for the ERS Standard Contract Term; otherwise, the QSE shall be deemed to have failed to meet this requirement. If the QSE’s portfolio-level availability factor for either ERS service type for the ERS Standard Contract Term is less than 1.0, the QSE’s ERS capacity payment shall be reduced according to the formulas in Section 6.6.11.1, Emergency Response Service Capacity Payments.

(b) Event Performance:

(i) QSEs representing ERS Resources must meet performance standards specified in Section 8.1.3.1.4, Event Performance Criteria for Emergency Response Service Resources, as applied on a portfolio-level basis. ERCOT’s calculation of portfolio performance shall weight each ERS Resource according to its committed share of the QSE portfolio capacity measured in MW. ERCOT shall determine a QSE’s portfolio-level event performance for each ERS service type by calculating a QSE portfolio-level event performance factor (ERSEPF*qr*). For purposes of evaluating ERS Loads, ERCOT shall establish a baseline representing the portfolio’s estimated Load, or, for DRG that has been designated by the QSE to be evaluated by using its native load, calculated 15-minute interval native load data in the absence of the ERS deployment event. For purposes of evaluating ERS Generators, ERCOT shall compute portfolio-level injection of energy to the ERCOT System. Using this data, ERCOT shall calculate an ERSEPF*qr* for each ERS deployment event based on the methodologies defined in Section 8.1.3.1.4. ERCOT shall then calculate an ERSEPF*qr* for the ERS Standard Contract Term, capped at 1.0. For an ERS Standard Contract Term with no ERS deployment events, the ERSEPF*qr* for the ERS Standard Contract Term shall be set to 1.0.

(ii) For an ERS Standard Contract Term with a single ERS deployment event, the ERSEPF*qr* for the ERS Standard Contract Term shall be the ERSEPF*qr* for the event. For an ERS Standard Contract Term with multiple ERS deployment events, ERCOT shall compute the QSE’s portfolio-level event performance factor for each ERS service type for the ERS Standard Contract Term by averaging the ERSEPF*qr* for all of the deployment events, weighted according to the duration of the events and capacity obligations by interval.

(iii) The ERSEPF*qr* for an ERS Standard Contract Term will determine both the event performance component of the ERS payment to the QSE and whether the QSE has met its ERS event performance requirements for that ERS service type. If an ERSEPF*qr* for an ERS Standard Contract Term is greater than or equal to 0.95, the QSE will be deemed to have met its event performance requirements for the ERS Standard Contract Term for that ERS service type; otherwise, the QSE shall be deemed to have failed to meet this requirement. If a QSE’s ERSEPF*qr* is less than 1.0 for the Standard Contract Term, the QSE’s ERS capacity payment shall be reduced according to the formulas in Section 6.6.11.1. For purposes of calculating an ERSEPF*qr*, any ERS Resource that was not subject to Dispatch during the event shall be treated as having met its obligation.

(iv) ERCOT will not include any Resources in the calculation of the ERSEPF*qr* if one or more sites of an ERS Resource were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline. QSEs must provide verification of such events from the TDSP or MRE.

(c) Ten-minute Deployment: Within ten minutes of ERCOT’s issuance of a VDI to deploy ERS-10, a QSE shall ensure that each ERS Resource participating in ERS-10 in its portfolio deploys in accordance with its obligations. For each ERS-10 deployment event, ERCOT shall assess each QSE’s compliance with this requirement by calculating a capacity-weighted QSE portfolio-level interval performance factor for the first full interval of the Sustained Response Period, using the methodologies defined in Section 8.1.3.1.4.

(d) Thirty-minute Deployment: Within 30 minutes of ERCOT’s issuance of a VDI to deploy ERS-30, a QSE shall ensure that each ERS Resource participating in its portfolio deploys in accordance with its obligations. For each ERS-30 deployment event, ERCOT shall assess each QSE’s compliance with this requirement by calculating a capacity-weighted QSE portfolio-level interval performance factor for the first full interval of the Sustained Response Period, using the methodologies defined in Section 8.1.3.1.4.

(2) Failure by a QSE portfolio to meet its ERS event performance or availability requirements shall not be cause for revocation of the QSE’s Ancillary Services qualification.

***8.1.3.3.4 Performance Criteria for Qualified Scheduling Entities Representing Weather-Sensitive Emergency Response Service Loads***

(1) A QSE’s ERS performance will be evaluated based on the performance of its portfolio of Weather-Sensitive ERS Loads during ERS deployment events in an ERS Standard Contract Term as follows:

(a) ERCOT shall compute the following quantities at the QSE portfolio level for each interval of a deployment: MW obligation, baseline estimate and actual Demand as the sum of the respective quantities across the ERS Loads, or, for DRG that has been designated by the QSE to be evaluated by using its native load, calculated 15-minute interval native load data in the portfolio with obligations for that interval. In addition, ERCOT shall compute the QSE’s portfolio-level prorated total obligations as the weighted sum of the obligations of the deployed ERS Loads weighted by the ratio the number of sites participating in the ERS Load during the event to the maximum number of sites projected by the QSE at the time of offer submission and the prorated interval fraction value (IntFrac) for each interval of a deployment as the average respectively of the interval fractions for each of the ERS Loads within its portfolio weighted by the ERS Load’s obligation for that interval multiplied by the ratio of the number of sites participating in the ERS Load during the event to the maximum number of sites projected by the QSE at the time of offer submission.

(b) ERCOT shall compute the QSE’s portfolio-level event interval performance factor for each interval of a deployment as specified in Section 8.1.3.1.4, Event Performance Criteria for Emergency Response Service Resources, using the values computed in paragraph (a) above.

(c) ERCOT shall compute the QSE’s portfolio-level Weather-Sensitive ERS Load event performance factor (ERSEPF) for each test and event as the weighted average of the event interval performance factors calculated in paragraph (b) above, weighted by the prorated obligation and interval fractions (IntFrac) computed in paragraph (a) above.

(d) ERCOT shall compute the QSE’s portfolio-level Weather-Sensitive ERS Load event performance factor for the ERS Contract Period as the average of the event interval performance factors for all tests and events during the ERS Contract Period calculated in paragraph (b) above weighted by the prorated obligation and interval fractions computed in paragraph (a) above.

(e) ERCOT will not include any Weather-Sensitive ERS Loads in the calculation of the ERSEPF if 10% or more sites of an ERS Load were disabled or unverifiable due to events on the TDSP side of the meter affecting the supply, delivery or measurement of electricity either during the event or prior that impacts the creation of a credible baseline. QSEs must provide verification of such events from the TDSP or MRE.

**8.1.3.4 ERCOT Data Collection for Emergency Response Service**

(1) ERCOT will collect all data necessary to analyze offers, Self-Provision offers, and all availability and performance obligations of ERS Resources and their QSEs under the Protocols. QSEs and ERS Resources they represent are required to provide any data to ERCOT that ERCOT may require, as specified by ERCOT.

8.2 ERCOT Performance Monitoring

(1) ERCOT shall continually assess its operations performance for the following activities:

(a) Coordinating the wholesale electric market transactions;

(b) System-wide transmission planning; and

(c) Network reliability.

(2) The Technical Advisory Committee (TAC), or a subcommittee designated by TAC, shall review ERCOT’s performance in controlling the ERCOT Control Area according to requirements and criteria set out in the TAC- and ERCOT Board-approved monitoring program. Assessments and reports include the following ERCOT activities:

(a) Transmission control:

(i) Transmission system availability statistics;

(ii) Outage scheduling statistics for Transmission Facilities Outages (maintenance planning, construction coordination, etc.); and

(iii) Metrics describing performance of the State Estimator (SE);

(b) Resource control:

(i) Outage scheduling statistics for Resource facilities Outages (maintenance planning, construction coordination, etc.);

(ii) Resource control metrics as defined in the Operating Guides;

(iii) Metrics describing Reliability Unit Commitment (RUC) commitments and deployments;

(iv) Metrics describing conflicting instructions to Generation Resources from interval to interval;

(v) Metrics describing the overall Resource response to frequency deviations in the ERCOT Region; and

(vi) Voltage and reactive control performance;

(c) Settlement stability:

(i) Track number of price changes that occur after a Settlement Statement has posted for an Operating Day;

(ii) Track number and types of disputes submitted to ERCOT and their disposition;

(iii) Report on compliance with timeliness of response to disputes;

(iv) Number of resettlements required due to non-price errors pursuant to paragraphs (2) and (4) of Section 9.2.5, DAM Resettlement Statement, and paragraph (2) of Section 9.5.6, RTM Resettlement Statement;

(v) Other Settlement metrics; and

(vi) Availability of Electric Service Identifier (ESI ID) consumption data in conformance with Settlement timeline;

(d) Performance in implementing network model updates;

(e) Network Operations Model validation, by comparison to other appropriate models or other methods;

(f) System and Organization Control (SOC) audit results regarding ERCOT’s market Settlements operations;

(g) Net Allocation to Load:

(i) ERCOT shall calculate and report on a quarterly basis all charges allocated to Load for all Qualified Scheduling Entities (QSEs) for each month for the most recent thirteen months expressed in total dollars. ERCOT will sum all charges allocated to Load for all QSEs, and divide that total by the total Real-Time Adjusted Metered Load (AML), showing results in dollars per MWh.

(ii) The Load-Allocated CRR Monthly Revenue Zonal Amount (LACMRZAMT), as calculated in paragraph (5) of Section 7.5.7, Method for Distributing CRR Auction Revenues, will be summed by Congestion Management Zone (CMZ) for each month for the most recent 13 months, and divided by the sum of the Real-Time AML by CMZ for each month, showing results in dollars per MWh per CMZ.

(iii) ERCOT will calculate the total dollars per MWh by CMZ by summing all charges allocated to Load for all QSEs, excluding LACMRZAMT, and dividing that total by the Real-Time AML; this rate will then be added to item (ii) above to calculate the total dollars per MWh by CMZ.

8.3 TSP Performance Monitoring and Compliance

(1) ERCOT shall develop a Technical Advisory Committee (TAC)- and ERCOT Board-approved Transmission Service Provider (TSP) monitoring program to be included in the Operating Guides for TSPs, which shall include the following:

(a) Real-Time data:

(i) Telemetry performance; and

(b) Compliance with model update requirements, including provision of network data in Common Informational Model (CIM) compatible format and consistency with the Transmission Element naming convention developed in accordance under Section 3, Management Activities for the ERCOT System.

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| [NPRR857: Replace Section 8.3 above with the following upon system implementation:]  **8.3 TSP and DCTO Performance Monitoring and Compliance**  (1) ERCOT shall develop a Technical Advisory Committee (TAC)- and ERCOT Board-approved Transmission Service Provider (TSP) and Direct Current Tie Operator (DCTO) monitoring program to be included in the Operating Guides for TSPs and DCTOs, which shall include the following:  (a) Real-Time data:  (i) Telemetry performance; and  (b) Compliance with model update requirements, including provision of network data in Common Informational Model (CIM) compatible format and consistency with the Transmission Element naming convention developed in accordance under Section 3, Management Activities for the ERCOT System. |

8.4 ERCOT Response to Market Non-Performance

(1) ERCOT may require a Market Participant to develop and implement a corrective action plan to address its failure to meet performance criteria in this Section. The Market Participant must deliver a copy of this plan to ERCOT and must report to ERCOT periodically on the status of the implementation of the corrective action plan.

(2) ERCOT may revoke any or all Ancillary Service qualifications of any Generation Resource or Load Resource for continued material non-performance in providing Ancillary Service capacity or energy.

(3) ERCOT may suspend any Emergency Response Service (ERS) Resource for continued material non-performance in providing ERS.

8.5 Primary Frequency Response Requirements and Monitoring

8.5.1 Generation Resource and QSE Participation

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| [NPRR989: Replace Section 8.5.1 above with the following upon system implementation:]  8.5.1 Generation Resource, Energy Storage Resource, and QSE Participation |

**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, NPRR989, and NPRR1011: Insert applicable portions of paragraph (2) below upon system implementation for NPRR863 and NPRR989; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011:]  (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. |

**8.5.1.2 Reporting**

(1) Each Resource Entity shall conduct applicable Governor tests on each of its Generation Resources as specified in the Operating Guides. The Resource Entity shall provide test results and other relevant information to ERCOT. ERCOT shall make these results available to the Transmission Service Providers (TSPs).

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (1) above with the following upon system implementation:]  (1) Each Resource Entity shall conduct applicable Governor tests on each of its Generation Resources and ESRs as specified in the Operating Guides. The Resource Entity shall provide test results and other relevant information to ERCOT. ERCOT shall make these results available to the Transmission Service Providers (TSPs). |

(2) Generation Resource Governor modeling information required in the ERCOT planning criteria must be determined from actual Generation Resource testing described in the Operating Guides. Within 30 days of ERCOT’s request, the results of the latest test performed must be supplied to ERCOT and the connected TSP.

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| [NPRR989: Replace paragraph (2) above with the following upon system implementation:]  (2) Generation Resource and ESR Governor modeling information required in the ERCOT planning criteria must be determined from actual Generation Resource or ESR testing described in the Operating Guides. Within 30 days of ERCOT’s request, the results of the latest test performed must be supplied to ERCOT and the connected TSP. |

(3) Each QSE shall inform ERCOT as soon as practical when notified by its On-Line Generation Resource, SOTG, or SOTSG of the Governor being out-of-service. The QSE shall supply related logs to ERCOT upon request.

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| [NPRR989: Replace paragraph (3) above with the following upon system implementation:]  (3) Each QSE shall inform ERCOT as soon as practical when notified by its On-Line Generation Resource, ESR, SOTG, or SOTSG of the Governor being out-of-service. The QSE shall supply related logs to ERCOT upon request. |

(4) If a Generation Resource trips Off-Line during a disturbance, as defined by the North American Electric Reliability Corporation (NERC), while providing Primary Frequency Response, the QSE shall report the cause of the failure to ERCOT as soon as the cause has been identified.

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| [NPRR989: Replace paragraph (4) above with the following upon system implementation:]  (4) If a Generation Resource or ESR trips Off-Line during a disturbance, as defined by the North American Electric Reliability Corporation (NERC), while providing Primary Frequency Response, the QSE shall report the cause of the failure to ERCOT as soon as the cause has been identified. |

**8.5.1.3 Wind-powered Generation Resource (WGR) Primary Frequency Response**

(1) Wind-powered Generation Resources (WGRs) with Standard Generation Interconnection Agreements (SGIAs) signed after January 1, 2010 shall provide Primary Frequency Response to frequency deviations from 60 Hz. The WGR automatic control system design shall have an adjustable dead band that can be set as specified in the Operating Guides. The Primary Frequency Response shall be specified in the Operating Guides. For WGRs with SGIAs executed on or prior to January 1, 2010, those not already equipped with Primary Frequency Response shall by December 1, 2011 acquire that capability. Those WGRs that cannot technically be retrofitted with Primary Frequency Response capability shall submit an attestation to ERCOT by June 1, 2010 explaining the technical infeasibility. At ERCOT’s sole discretion, those WGRs for which Primary Frequency Response is technically infeasible may be granted a permanent exemption from the requirement. ERCOT shall make a determination within 180 days of receipt of the attestation. If ERCOT does not grant an exemption, the WGR shall acquire the capability to provide Primary Frequency Response within 24 months of being notified of that determination. If ERCOT grants the exemption, then ERCOT may require the WGR to install alternate measures, such as over-frequency relays, that are technically feasible and would approximate Primary Frequency Response to events above 60.1 Hz.

8.5.2 Primary Frequency Response Measurements

(1) ERCOT, with the assistance of the appropriate Technical Advisory Committee (TAC) subcommittee, shall analyze the performance of Generation Resources, SOTGs, SOTSGs, Resources capable of Fast Frequency Response (FFR), and Controllable Load Resources for all Frequency Measurable Events (FMEs) in accordance with the Operating Guides. In support of this analysis, ERCOT shall post the following:

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (1) above with the following upon system implementation:]  (1) ERCOT, with the assistance of the appropriate Technical Advisory Committee (TAC) subcommittee, shall analyze the performance of Generation Resources, ESRs, SOTGs, SOTSGs, Resources capable of Fast Frequency Response (FFR), and Controllable Load Resources for all Frequency Measurable Events (FMEs) in accordance with the Operating Guides. In support of this analysis, ERCOT shall post the following: |

(a) ERCOT shall post on the ERCOT website the occurrence of an FME within 14 calendar days of occurrence.

(b) ERCOT shall post on the Market Information System (MIS) Certified Area for Performance, Disturbance, Compliance Working Group (PDCWG) analysis, the Primary Frequency Response Unit Performance for each Generation Resource, SOTG, SOTSG, and Controllable Load Resource that is measured in the FME.

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (b) above with the following upon system implementation:]  (b) ERCOT shall post on the MIS Certified Area for Performance, Disturbance, Compliance Working Group (PDCWG) analysis, the Primary Frequency Response Unit Performance for each Generation Resource, ESR, SOTG, SOTSG, and Controllable Load Resource that is measured in the FME. |

(c) ERCOT shall post on the ERCOT website a monthly report that displays the frequency response of the ERCOT System for a rolling average of the last six FMEs.

(d) ERCOT shall post on the ERCOT website an annual report that displays the minimum frequency response computation methodology of the ERCOT System.

(e) ERCOT shall post on the MIS Certified Area the Primary Frequency Response 12-month rolling average for each Generation Resource, SOTG, SOTSG, Resource capable of FFR, and Controllable Load Resource.

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (e) above with the following upon system implementation:]  (e) ERCOT shall post on the MIS Certified Area the Primary Frequency Response 12-month rolling average for each Generation Resource, ESR, SOTG, SOTSG, Resource capable of FFR, and Controllable Load Resource. |

**8.5.2.1 ERCOT Required Primary Frequency Response**

(1) All Generation Resources, SOTGs, SOTSGs, Resources capable of FFR, and Controllable Load Resources shall provide Primary Frequency Response in accordance with the requirements established in the Operating Guides.

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (1) above with the following upon system implementation:]  (1) All Generation Resources, ESRs, SOTGs, SOTSGs, and Controllable Load Resources shall provide Primary Frequency Response in accordance with the requirements established in the Operating Guides. |

(2) ERCOT shall evaluate, with the assistance of the appropriate TAC subcommittee, Primary Frequency Response during FMEs. The actual Generation Resource response must be compiled to determine if adequate Primary Frequency Response was provided.

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (2) above with the following upon system implementation:]  (2) ERCOT shall evaluate, with the assistance of the appropriate TAC subcommittee, Primary Frequency Response during FMEs. The actual Generation Resource or ESR response must be compiled to determine if adequate Primary Frequency Response was provided. |

(3) ERCOT and the appropriate TAC subcommittee shall review each FME, verifying the accuracy of data. Data that is in question may be requested from the QSE for comparison or individual Generation Resource data may be retrieved from ERCOT’s database.

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| [NPRR963 and NPRR989: Replace applicable portions of paragraph (3) above with the following upon system implementation:]  (3) ERCOT and the appropriate TAC subcommittee shall review each FME, verifying the accuracy of data. Data that is in question may be requested from the QSE for comparison or individual Resource data may be retrieved from ERCOT’s database. |

**8.5.2.2 ERCOT Data Collection**

(1) ERCOT shall collect all data necessary to analyze each FME.