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| NOGRR Number | [211](http://www.ercot.com/mktrules/issues/NOGRR211) | NOGRR Title | RTC – NOG 2 and 9: System Operations and Control Requirements and Monitoring Programs |
| Date of Decision | | November 18, 2020 | |
| Action | | Recommended Approval | |
| Timeline | | Urgent | |
| Proposed Effective Date | | Upon system implementation of Nodal Protocol Revision Request (NPRR) 1007, RTC - NP 3: Management Activities for the ERCOT System | |
| Priority and Rank Assigned | | Not applicable | |
| Nodal Operating Guide Sections Requiring Revision | | 2.1, Operational Duties  2.2.4, Load Frequency Control  2.2.4.2, Regulation Provider Loss of AGC  2.3, Ancillary Services  2.3.1.2, Additional Operational Details for Responsive Reserve Providers  2.3.2.1, Additional Operational Details for Non-Spinning Reserve Service Providers  2.3.3.1, Additional Operational Details for ERCOT Contingency Reserve Service (ECRS) Providers  9.1.10, Current Operating Plan Metrics for QSEs | |
| Related Documents Requiring Revision/Related Revision Requests | | NPRR1007  NPRR1008, RTC - NP 4: Day-Ahead Operations  NPRR1009, RTC - NP 5: Transmission Security Analysis and Reliability Unit Commitment  NPRR1010, RTC - NP 6: Adjustment Period and Real-Time Operations  NPRR1011, RTC - NP 8: Performance Monitoring  NPRR1012, RTC - NP 9: Settlement and Billing  NPRR1013, RTC - NP 1, 2, 16, and 25: Overview, Definitions and Acronyms, Registration and Qualification of Market Participants, and Market Suspension and Restart  Other Binding Document Revision Request (OBDRR) 020, RTC - Methodology for Setting Maximum Shadow Prices for Network and Power Balance Constraints | |
| Revision Description | | This Nodal Operating Guide Revision Request (NOGRR) updates language related to Supplemental Ancillary Service Markets (SASMs), Ancillary Service deployment, and Ancillary Service responsibilities and obligations to address changes associated with the implementation of Real-Time Co-optimization (RTC) of energy and Ancillary Services. Specifically, this NOGRR addresses the following Key Principles:   * KP1.4 - Systems/Applications that Provide Input into the Real-Time Optimization Engine * KP1.5 – Process for Deploying Ancillary Services * KP4 – The Supplemental Ancillary Service Market Process * KP7 – Performance Monitoring | |
| Reason for Revision | | Addresses current operational issues.  Meets Strategic goals (tied to the [ERCOT Strategic Plan](http://www.ercot.com/content/wcm/lists/144926/ERCOT_Strategic_Plan_2019-2023.pdf) or directed by the ERCOT Board).  Market efficiencies or enhancements  Administrative  Regulatory requirements  Other: (explain)  *(please select all that apply)* | |
| Business Case | | This NOGRR updates language related to SASMs, Ancillary Service deployment, and Ancillary Service responsibilities and obligations to address changes associated with the implementation of RTC of energy and Ancillary Services. | |
| ROS Decision | | On 6/4/20, ROS unanimously voted via roll call to table NOGRR211. All Market Segments were present for the vote.  On 11/5/20, ROS unanimously voted via roll call to grant NOGRR211 Urgent status; to recommend approval of NOGRR211 as amended by the 10/23/20 ERCOT comments; and to forward to TAC NOGRR211 and the Impact Analysis. All Market Segments were present for the vote. | |
| Summary of ROS Discussion | | On 6/4/20, participants noted the desire to table NOGRR211 for continued review alongside its related Revision Requests at the Real-Time Co-optimization Task Force (RTCTF).  On 11/5/20, participants reviewed the 8/18/20 and 10/23/20 ERCOT comments and discussed the timeline necessary for approval of all RTC-related Revision Requests at the December 8, 2020 ERCOT Board meeting. | |
| TAC Decision | | On 11/18/20, TAC unanimously voted via roll call to recommend approval of NOGRR211 as recommended by ROS in the 11/5/20 ROS Report. All Market Segments were present for the vote. | |
| Summary of TAC Discussion | | On 11/18/20, there was no discussion. | |
| ERCOT Opinion | | ERCOT supports approval of NOGRR211. | |

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| Market Segment | Not applicable |

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| **Comments Received** | |
| Comment Author | **Comment Summary** |
| ERCOT 081820 | Proposed additional revisions reflecting RTCTF consensus |
| ERCOT 102320 | Proposed additional revisions reflecting RTCTF consensus |

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| Market Rules Notes |

Please note the baseline Nodal Operating Guide language in the following sections has been updated to reflect the incorporation of the following NOGRR(s) into the Nodal Operating Guide:

* NOGRR200, Delete Remaining Grey-Boxed Language Associated with NOGRR025, Monitoring Programs for QSEs, TSPs, and ERCOT (incorporated 9/1/20)
  + Section 9.1.4
* NOGRR204, Related to NPRR989, BESTF-1 Energy Storage Resource Technical Requirements (incorporated 7/1/20)
  + Section 2.3

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

* NOGRR210, Related to NPRR1005, Clarify Definition of Point of Interconnection (POI) and Add Definition Point of Interconnection Bus (POIB)
  + Section 2.3

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| Proposed Guide Language Revision |

**2.1 Operational Duties**

(1) The duties of ERCOT are described in relevant sections of the Protocols and North American Electric Reliability Corporation (NERC) Reliability Standards. These Operating Guides assume that all actions taken will be on components of, or related to, the ERCOT System unless otherwise specified. The primary operational duties of ERCOT are to ensure the reliability of the ERCOT System. In doing this ERCOT shall:

(2) Perform operational planning:

(a) Perform the Reliability Unit Commitment (RUC) processes in order to commit additional resources as needed to maintain reliability;

(b) Perform operational ERCOT Transmission Grid reliability studies, including those related to generation and load interconnection responsibilities;

(c) Review all Outages of Generation Resources and major transmission lines or components to identify and correct possible failure to meet credible N-1 criteria. This shall include possible failure to meet N-1 criteria not resolved through the Day-Ahead process;

(d) Perform load flows and security analyses of Outages submitted by Qualified Scheduling Entities (QSEs) or Transmission Service Providers (TSPs) as a basis for approval or rejection as described in Protocol Section 3.1, Outage Coordination;

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| ***[NOGRR177: Replace paragraph (d) above with the following upon system implementation of NPRR857:]***  (d) Perform load flows and security analyses of Outages submitted by Qualified Scheduling Entities (QSEs), Transmission Service Providers (TSPs), or Direct Current Tie Operators (DCTOs) as a basis for approval or rejection as described in Protocol Section 3.1, Outage Coordination; |

(e) Withdraw approval of a scheduled Outage if unable to meet credible N-1 criteria after all other reasonable options are exercised as described in Protocol Section 3.1;

(f) Serve as the point of contact for initiation of generation interconnection to the ERCOT Transmission Grid;

(g) Forecast Load and Resources for the next seven days for reliability planning; and

(h) Ensure that sufficient Resources in the proper location and required Ancillary Services have been committed for all expected Load on a Day-Ahead and Real-Time basis.

(3) Operate energy and Ancillary Service markets:

(a) Administer a Congestion Revenue Rights (CRR) market;

(b) Administer a Day-Ahead Market (DAM) including both energy and Ancillary Service;

(c) Administer the RUC processes; and

(d) Administer a Real-Time Market (RTM) including energy and Ancillary Services using Security-Constrained Economic Dispatch (SCED).

(4) Supervise the ERCOT System to meet NERC Reliability Standards:

(a) Monitor and evaluate ERCOT System conditions on a continuous basis;

(b) Coordinate with Transmission Operators (TOs), ERCOT System events to maintain or restore reliability;

(c) Dispatch generation via the SCED process and deployment of Ancillary Services to control frequency and congestion;

(d) Provide access to the ERCOT System on a nondiscriminatory basis;

(e) Approve schedules of interchange transactions across the Direct Current Ties (DC Ties); and

(f) Direct emergency operations.

(5) Collect and Disseminate Information:

(a) Collect, process, and disseminate market, operational and settlement information;

(b) Provide relevant operational information to Market Participants over the Market Information System (MIS);

(c) Collect and maintain operational data required by the Public Utility Commission of Texas (PUCT), NERC and Protocols;

(d) Receive reports from TOs and QSEs and forward them to the Department of Energy (DOE), NERC, and/or other Governmental Authority as required;

(e) Submit reports to DOE, NERC, and/or other Governmental Authority as required; and

(f) Record and report accumulated time error.

2.2.4 Load Frequency Control

(1) ERCOT shall operate the Load Frequency Control (LFC) system to maintain the scheduled frequency at 60 Hz (correcting periodically for time error) and to minimize the use of energy from Resources providing Regulation Service.

(2) The ERCOT LFC system shall deploy Regulation Service and Responsive Reserve (RRS) energy as necessary in accordance with Protocol Section 6.5.7.6, Load Frequency Control, to meet North American Electric Reliability Corporation (NERC) Reliability Standards. ERCOT shall purchase Regulation Service to provide satisfactory frequency control performance for the ERCOT Region. ERCOT shall determine the satisfactory amount of Regulation Service, required by statistical analysis of possible Resource Outages and Load forecast error, to expect operation of 95% of hours without deploying RRS.

(3) QSEs shall use Automatic Generation Control (AGC) to direct the output of generation facilities providing Regulation and RRS.

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| ***[NOGRR187: Replace Section 2.2.4 above with the following upon system implementation of NPRR863:]***  ***2.2.4 Load Frequency Control***  (1) ERCOT shall operate the Load Frequency Control (LFC) system to maintain the scheduled frequency at 60 Hz (correcting periodically for time error) and to minimize the use of energy from Resources providing Regulation Service.  (2) The ERCOT LFC system shall deploy Regulation Service, Responsive Reserve (RRS), and ERCOT Contingency Reserve Service (ECRS) as necessary in accordance with Protocol Section 6.5.7.6.2, LFC Deployment, to meet North American Electric Reliability Corporation (NERC) Reliability Standards. ERCOT shall purchase Regulation Service to provide satisfactory frequency control performance for the ERCOT Region. ERCOT shall determine the satisfactory amount of Regulation Service, required by statistical analysis of possible Resource Outages and Load forecast error, to expect operation of 95% of hours without deploying RRS.  (3) QSEs shall use Automatic Generation Control (AGC) to direct the output of generation facilities providing Regulation. |

**2.2.4.2 Regulation Provider Loss of AGC**

(1) If a QSE providing Regulation Services loses its AGC for any reason, it will notify ERCOT as soon as practicable of the reason for and estimated duration of the loss. ERCOT will assess whether additional action should be taken to maintain system frequency.

**2.3** **Ancillary Services**

(1) The types of Ancillary Services required by ERCOT are described below:

| **ANCILLARY SERVICE TYPE** | **DESCRIPTION** | **ERCOT AUTHORITY ACTION** |
| --- | --- | --- |
| Regulation Down Service (Reg-Down)  and  Regulation Up Service (Reg-Up)  (for Generation Resources)  ***Reference: Protocol Section 2, Definitions and Acronyms*** | Resource capacity provided by a Qualified Scheduling Entity (QSE) from a specific Generation Resource to control frequency within the system which is controlled second by second, normally by an Automatic Generation Control (AGC) system. | a. Reg-Down energy is a Resource-specific deployment to increase or decrease generation at a level below the Generation Resource’s Base Point in response to a change in system frequency.  b. Reg-Up energy is a Resource-specific deployment to increase or decrease generation at a level above the Generation Resource’s Base Point in response to a change in system frequency. |
| Reg-Down  and  Reg-Up  (for Load Resource)  ***Reference: Protocol Section 2*** | Load Resource capacity provided by a QSE from a specific Load Resource to control frequency within the system. | a. Reg-Down energy is a Resource-specific deployment to increase or decrease Load below the Load Resource’s Maximum Power Consumption (MPC) limit in response to a change in system frequency.  b. Reg-Up is a Resource-specific deployment to increase or decrease Load above the Load Resource’s Low Power Consumption (LPC) limit in response to a change in system frequency. |
| Responsive Reserve (RRS)  ***Reference: Protocol Section******2*** | Operating reserves on Generation Resources, Load Resources, and Resources capable of providing Fast Frequency Response (FFR) maintained by ERCOT to help control the frequency of the system. RRS on Generation Resources and Controllable Load can be used as energy during an Energy Emergency Alert (EEA) event. | RRS may only be deployed as follows:  a. Through automatic Governor action or under-frequency relay in response to frequency deviations;  b. By electronic signal from ERCOT in response to the need; and  c. As ordered by an ERCOT Operator during an EEA or other emergencies. |
| Non-Spinning Reserve (Non-Spin) Service  ***Reference: Protocol Section 2*** | a. Off-Line Generation Resource capacity, or reserved capacity from On-Line Generation Resources, capable of being ramped to a specified output level within 30 minutes, and operating at a specified output forat least one hour.  b. Controllable Load Resources that are capable of ramping to an ERCOT-instructed consumption level within 30 minutes and consuming at the ERCOT-instructed level for at least one hour. | Deployed in response to loss-of-Resource contingencies, Load forecasting error, or other contingency events on the system. See Protocol Section 6.5.7.6.2.3, Non-Spinning Reserve Service Deployment. |
| Voltage Support Service (VSS)  ***Reference: Protocol Section* *3.15, Voltage Support*** | Reactive capability of a Generation Resource that is required to maintain transmission and distribution voltages on the ERCOT Transmission Grid within acceptable limits. All Generation Resources with a gross rating greater than 20 MVA shall provide VSS. | Direct the scheduling of VSS by providing Voltage Profiles at the point of interconnection. The Generation Resource is obligated to maintain the published voltage profile within its Corrected Unit Reactive Limit (CURL). |
| Black Start Service (BSS)  ***Reference: Protocol Section* *3.14.2, Black Start*** | The provision of Generation Resources under a Black Start Agreement, which are capable of self-starting without support from within ERCOT in the event of a Partial Blackout or Blackout. | Provide emergency Dispatch Instructions to begin restoration to a secure operating state after a Partial Blackout or Blackout. |
| Reliability Must-Run (RMR) Service  ***Reference: Protocol Section* *3.14.1, Reliability Must Run*** | The provision of Generation Resource capacity and energy under an RMR Agreement. | Enter into contractual agreements to retain units required for reliable operations. Direct the operation of those units that otherwise would not operate and that are necessary to provide reliable operations. |

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| ***[NOGRR187 and NOGRR204: Replace applicable portions of paragraph (1) above with the following upon system implementation of NPRR863 or NPRR989, respectively:]***  (1) The types of Ancillary Services required by ERCOT are described below:   | **ANCILLARY SERVICE TYPE** | **DESCRIPTION** | **ERCOT AUTHORITY ACTION** | | --- | --- | --- | | Regulation Down Service (Reg-Down)  and  Regulation Up Service (Reg-Up)  (for Generation Resources and Energy Storage Resources (ESRs))  ***Reference: Protocol Section******2, Definitions and Acronyms*** | Resource capacity provided by a Qualified Scheduling Entity (QSE) from a specific Generation Resource or ESR to control frequency within the system which is controlled second by second, normally by an Automatic Generation Control (AGC) system. | a. Reg-Down energy is a Resource-specific deployment to increase or decrease generation at a level below the Generation Resource’s or ESR’s Base Point in response to a change in system frequency.  b. Reg-Up energy is a Resource-specific deployment to increase or decrease generation at a level above the Generation Resource’s or ESR’s Base Point in response to a change in system frequency. | | Reg-Down  and  Reg-Up  (for Load Resource)  ***Reference: Protocol Section******2*** | Load Resource capacity provided by a QSE from a specific Load Resource to control frequency within the system. | a. Reg-Down is a Resource-specific deployment to increase or decrease Load below the Load Resource’s Maximum Power Consumption (MPC) limit in response to a change in system frequency.  b. Reg-Up is a Resource-specific deployment to increase or decrease Load above the Load Resource’s Low Power Consumption (LPC) limit in response to a change in system frequency. | | Responsive Reserve (RRS)  ***Reference: Protocol Section******2*** | Operating reserves on Generation Resources, ESRs, Load Resources, and Resources capable of providing Fast Frequency Response (FFR) maintained by ERCOT to help control the frequency of the system. RRS on Generation Resources, ESRs, and Controllable Load can be used as energy during an Energy Emergency Alert (EEA) event. | RRS may only be deployed as follows:  a. Through automatic Governor action or under-frequency relay in response to frequency deviations;  b. By electronic signal from ERCOT in response to the need; and  c. As ordered by an ERCOT Operator during an EEA or other emergencies. | | ERCOT Contingency Reserve Service (ECRS)  ***Reference: Protocol Section******2*** | a. Off-Line Generation Resource or ESR capacity, or reserved capacity from On-Line Generation Resources or ESRs, capable of being ramped to a specified output level within ten minutes, and operating at a specified output for at least one hour.  b. Controllable Load Resources dispatchable by SCED that are capable of ramping to an ERCOT-instructed consumption level within ten minutes and consuming at the ERCOT-instructed level forat least one hour.  c. Load Resources other than Controllable Load Resources that may or may not be controlled by under-frequency relay that are capable of interrupting within ten minutes at ERCOT instruction for at least one hour. | Deployed in response to loss-of-Resource contingencies, Load forecasting error, or other contingency events on the system. See Protocol Section 6.5.7.6.2.4, Deployment and Recall of ERCOT Contingency Reserve Service. | | Non-Spinning Reserve (Non-Spin) Service  ***Reference: Protocol Section 2*** | a. Off-Line Generation Resource or ESR capacity, or reserved capacity from On-Line Generation Resources or ESRs, capable of being ramped to a specified output level within 30 minutes, and operating at a specified output forat least one hour.  b. Controllable Load Resources that are capable of ramping to an ERCOT-instructed consumption level within 30 minutes and consuming at the ERCOT-instructed level for at least one hour. | Deployed in response to loss-of-Resource contingencies, Load forecasting error, or other contingency events on the system. See Protocol Section 6.5.7.6.2.3, Non-Spinning Reserve Service Deployment. | | Voltage Support Service (VSS)  ***Reference: Protocol Section* *3.15, Voltage Support*** | Reactive capability of a Generation Resource or ESR that is required to maintain transmission and distribution voltages on the ERCOT Transmission Grid within acceptable limits. All Generation Resources and ESRs with a gross rating greater than 20 MVA shall provide VSS. | Direct the scheduling of VSS by providing Voltage Profiles at the point of interconnection. The Generation Resource or ESR is obligated to maintain the published voltage profile within its Corrected Unit Reactive Limit (CURL). | | Black Start Service (BSS)  ***Reference: Protocol Section* *3.14.2, Black Start*** | The provision of Generation Resources under a Black Start Agreement, which are capable of self-starting without support from within ERCOT in the event of a Partial Blackout or Blackout. | Provide emergency Dispatch Instructions to begin restoration to a secure operating state after a Partial Blackout or Blackout. | | Reliability Must-Run (RMR) Service  ***Reference: Protocol Section* *3.14.1, Reliability Must Run*** | The provision of Generation Resource capacity and energy under an RMR Agreement. | Enter into contractual agreements to retain units required for reliable operations. Direct the operation of those units that otherwise would not operate and that are necessary to provide reliable operations. | |

**2.3.1.2 Additional Operational Details for Responsive Reserve Providers**

(1) ERCOT shall specify the minimum amount of RRS provided by Generation Resources as outlined in Section 2.3.1.2.1, Limit on Generation Resources and Controllable Load Resources Providing RRS. QSE’s Generation Resources providing RRS must be On-Line, immediately responsive to system frequency deviations.

(2) RRS provided by a QSE shall meet the requirements as defined in item (3) of Protocol Section 3.18, Resource Limits in Providing Ancillary Service.

(3) ERCOT shall issue Dispatch Instructions for RRS through Inter-Control Center Communications Protocol (ICCP) to a QSE representing a Generation Resource in synchronous condenser fast-response mode that is responding to a Frequency Measurable Event (FME) at or below the frequency set point specified in paragraph (3)(b) of Protocol Section 3.18, or under manual deployment when system frequency does not go below the frequency set point specified in paragraph (3)(b) of Protocol Section 3.18. Dispatch Instructions under this section shall only occur during scarcity conditions, as specified in Protocol Section 6.5.9.4.2, EEA Levels, or in an attempt to recover frequency to meet NERC Standards.

(4) Unless ERCOT issues a recall instruction for the RRS deployed via ICCP, the QSE of the Generation Resource operating in synchronous condenser fast-response mode may contact ERCOT to determine if it is allowed to recall and reset the individual unit(s) to the synchronous condenser fast-response mode.

(5) ERCOT, at its sole discretion, may request that the Generation Resource operating in synchronous condenser fast-response mode remain On-Line and generating after an initial deployment. The request to remain On-Line and generating after an initial deployment may not exceed 30 minutes per deployment for each frequency deviation or event nor shall such request exceed two hours per a consecutive 12-hour period in aggregate unless ERCOT has declared an EEA.

(6) Load Resources providing RRS must be either a Controllable Load Resource qualified for Security-Constrained Economic Dispatch (SCED) and capable of providing Primary Frequency Response or a Load Resource controlled by high-set under-frequency relays for automatic interruption. For eligibility to participate as a RRS provider, reference Protocol Section 8.1.1.2.1.2, Responsive Reserve Service Qualification. Load Resources controlled by high-set under-frequency relays shall also complete the following requirements:

(a) The under-frequency relay must have a delay of no more than 20 cycles (or 0.33 seconds for relays that do not count cycles). Total time from the time frequency first decays to a value low enough to initiate action of the under frequency relay(s) to the time Load is interrupted should be no more than 30 cycles, including all relay and breaker operating times;

(b) The initiation setting of the under-frequency relay shall not be any lower than 59.7 Hz; and

(c) The Load Resource must be able to remain interrupted during actual event until replaced by other net dependable capability. In no case may interrupted Load be restored to service without the approval of an ERCOT operator.

(7) To become and remain fully qualified as a provider of RRS, the Load Resource shall complete the requirements above and the following:

(a) Pass simulated or actual testing according to ERCOT procedures; and

(b) Perform verification testing as described in Section 8, Attachment G, Load Resource Tests.

(8) Hydro Unit(s) – Modes of RRS that will be counted:

(a) Synchronous condenser fast response mode **-** described in item (3) of Protocol Section 3.18;

(b) Generation MW mode **-** For any Generation Resource with a 5% droop setting operating as a generator, the amount of RRS provided is dependent upon the verified droop characteristics of the Resource;

(c) Synchronous Condenser Mode in “Manual” Dispatch Mode - Units will supply MWs based on operator action within the ten-minute Protocol requirement for supplying RRS. Once deployed these units are frequency responsive; and

(d) A Real-Time signal of the MW capacity of units being operated in any of the synchronous condenser modes is telemetered to ERCOT.

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| ***[NOGRR187: Replace paragraph (8) above with the following upon system implementation of NPRR863:]***  (8) Generation Resource operating in synchronous condenser fast-response mode – Modes of RRS and/or ECRS that will be counted:  (a) Synchronous condenser fast response mode **-** described in item (3)(b) or (4)(c) of Protocol Section 3.18;  (b) Generation MW mode **-** For any Generation Resource with a 5% droop setting operating as a generator, the amount of RRS provided is dependent upon the verified droop characteristics of the Resource;  (c) Synchronous Condenser Mode in “Manual” Dispatch Mode - Units will supply MWs based on operator action within the ten-minute Protocol requirement for supplying RRS or ECRS. Once deployed these units are frequency responsive; and  (d) A Real-Time signal of the MW capacity of units being operated in any of the synchronous condenser modes is telemetered to ERCOT. |

(9) Each Resource seeking RRS qualification as a Resource capable of providing FFR must be On-Line and shall also meet the following requirements:

(a) The total time from the time frequency first decays to a value low enough to initiate action up to the time when full Ancillary Service Resource Responsibility for RRS is delivered should be no more than 15 cycles, including all relay and breaker operating times;

(b) The initiation setting of the under-frequency relay or similar trigger mechanism shall not be any lower than 59.85 Hz;

(c) A Resource must demonstrate its ability to sustain the scheduled level of deployment for at least 15 minutes at a minimum level of 95% but not more than a maximum level of 110% of the MW capacity for which the Resource seeks qualification for FFR; and

(d) Resource providing FFR shall be capable of measuring and recording ERCOT Frequency (Hz) and MW output with a resolution of no less than 32 samples per second.

(10) Control performance during periods in which ERCOT has deployed FFR shall be based on the requirements below:

(a) For any FFR deployment event, ERCOT will collect the following data:

(i) High speed event data from Resources that are not deployed via breaker action;

(ii) High speed event data from the recorders at ERCOT’s primary and back-up facilities;

(iii) High speed event data from phasor measurement units available to ERCOT;

(iv) Telemetry data for all Resources providing FFR during the event; and

(v) Recording of ERCOT frequency (Hz) and MW output with a resolution of no less than 32 samples per second.

(b) The performance of a Load Resource providing FFR in response to an RRS Dispatch Instruction shall be determined by subtracting the Load Resource’s actual Load response from the average of the telemetered net real power consumption values for the five minutes preceding the Dispatch Instruction (“meter before / meter after”).  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.

(c) For an FFR deployment event triggered by an under-frequency event (frequency at or below 59.85 Hz). ERCOT will use the collected data to determine if the following requirements were met:

(i) The total time from the time frequency first decays to a value low enough to initiate action up to the time when full Ancillary Service award for RRS is delivered should be no more than 15 cycles, including all relay and breaker operating times;

(ii) The Resource deployed 95% to 110% of its Ancillary Service award for RRS in 15 cycles after the frequency reached 59.85 Hz;

(iii) The SCED-dispatchable Resource sustained 95% to 110% of its Ancillary Service award for RRS;

(iv) The non-Controllable Load Resource providing FFR sustained 95% to 110% of its Ancillary Service award for RRS for the duration of the sustained response period, defined as 15 minutes or until the time of recall instruction from ERCOT, whichever occurred first;

(v) Upon completion of deployment, ERCOT will issue a recall instruction to a Resource providing FFR.  Once the recall instruction is issued to Resources providing FFR, the Resource shall continue following its Updated Desired Set Point (UDSP).  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.

(d) For an FFR deployment of non-Controllable Load Resources through a VDI, in addition to the data listed in paragraph (a) above, ERCOT will collect a voice recording of the VDI to document the time of the instruction.  The official start of the ramp period for the FFR deployment is the end of the ERCOT Operator’s acknowledgement that the read back of the instruction was correct.  ERCOT will use the collected data to determine if the following requirements were met:

(i) The Resource deployed 95% to 110% of its Ancillary Service award for RRS within ten minutes after the start of the ramp period;

(ii) The Resource sustained 95% to 110% of its Ancillary Service award for RRS for the duration of the sustained response period, defined as 15 minutes or until the time of recall instruction from ERCOT, whichever occurred first;

(iii) Upon completion of deployment, ERCOT will issue a recall instruction to a Resource providing FFR.  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.

(11) If a failure occurs at the QSE or sub-QSE level, as part of any compliance review ERCOT shall identify the individual Resource(s) responsible for the failure.  QSEs representing Resources providing FFR will have an opportunity to provide ERCOT with site-specific high resolution data (at least 32 samples per second) for further analysis.  Regardless of the QSE’s or sub-QSE level performance, ERCOT may require any individual Resource that fails to meet its FFR performance criteria to submit a corrective action plan and may suspend a Resource’s qualification to provide FFR for a pattern of non-performance.

**2.3.2.1 Additional Operational Details for Non-Spinning Reserve Service Providers**

(1) Non-Spin Service Generation Resource providers, including MW from power augmentation, must be capable of being synchronized and ramped to a specified output level within 30 minutes of notification of deployment and run at a specified output level for at least one hour, as specified in item (1)(a) of Protocol Section 3.17.3, Non-Spinning Reserve Service.

(2) Non-Spin Controllable Load Resource providers must be capable of ramping to an ERCOT-instructed consumption level within 30 minutes and consuming at the ERCOT-instructed level for at least one hour, as specified in item (1)(b) of Protocol Section 3.17.3.

(3) To become provisionally qualified as a provider of Non-Spin, a Controllable Load Resource shall complete the following requirements:

(a) Register as a Controllable Load Resource with ERCOT;

(b) Complete asset registration of the Controllable Load Resource;

(c) Provide ERCOT the appropriate Non-Spinning Load affidavit;

(d) Test to verify appropriate voice communications are in place for VDIs by ERCOT;

(e) Provide telemetry through the QSE to ERCOT in accordance with all applicable requirements set forth in paragraph (5) of Protocol Section 6.5.5.2, Operational Data Requirements; and

(f) Be able to consume at an ERCOT-instructed level during an ERCOT deployment for a minimum of one hour.

(4) To become and remain fully qualified as a provider of Non-Spin, the Controllable Load Resource shall complete all the requirements for provisional qualification identified above and the following:

(a) Respond successfully to an actual ERCOT deployment or pass simulated or actual testing according to ERCOT’s Procedure; and

(b) Perform verification testing as described in Section 8, Attachment G, Load Resource Tests.

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| ***[NOGRR187: Insert Sections 2.3.3 and 2.3.3.1 below upon system implementation of NPRR863:]***  ***2.3.3 ERCOT Contingency Reserve Service***  **2.3.3.1 Additional Operational Details for ERCOT Contingency Reserve Service (ECRS) Providers**  (1) Generation Resources providing ECRS must be capable of being synchronized and ramped to a specified output level within ten minutes of notification of deployment and run at a specified output level for at least one hour.  (2) Controllable Load Resource providing ECRS must be capable of ramping to an ERCOT-instructed consumption level within ten minutes and consuming at the ERCOT-instructed level for at least one hour.  (3) To become provisionally qualified as a provider of ECRS, a Controllable Load Resource shall complete the following requirements:  (a) Register as a Controllable Load Resource with ERCOT;  (b) Provide ERCOT the ECRS Load affidavit;  (c) Test to verify primary and alternative voice communications are in place for VDIs by ERCOT;  (d) Provide telemetry through the QSE to ERCOT in accordance with all applicable requirements set forth in paragraph (5) of Protocol Section 6.5.5.2, Operational Data Requirements; and  (e) Be able to maintain consumption at an ERCOT-instructed level during an ERCOT-instructed test for the entire duration of the test period.  (4) To become and remain fully qualified as a provider of ECRS, the Controllable Load Resource shall complete all the requirements for provisional qualification identified above and the following:  (a) Respond successfully to an actual ERCOT deployment or pass actual testing according to ERCOT’s Procedure; and  (b) Perform verification testing as described in Section 8, Attachment G, Load Resource Tests.  (5) The total amount of ECRS that Load Resources other than Controllable Load Resources may provide shall not exceed 50% of the total ERCOT-wide ECRS requirement. A Load Resource must be loaded and capable of unloading the scheduled amount of ECRS within ten minutes of instruction by ERCOT or be interrupted by action of under-frequency relays.  (a) Load Resources that are providing ECRS are not required to be controlled by high-set under-frequency relays.  (b) Load Resources controlled by high-set under-frequency relays and providing ECRS shall meet the relay setting requirement stated in paragraph (6) of Section 2.3.1.2, Additional Operational Details for Responsive Reserve Providers.  (6) ERCOT shall deploy ECRS to meet NERC Reliability Standards and other performance criteria as specified in these Operating Guides and the Protocols by Dispatch Instruction for ECRS through Inter-Control Center Communications Protocol (ICCP) to a QSE representing a Generation Resource in synchronous condenser fast-response mode that is responding to a Frequency Measurable Event (FME) at or below the frequency set point specified in paragraph (3)(b) of Protocol Section 3.18, or under manual deployment when system frequency does not go below the frequency set point specified in paragraph (3)(b) of Protocol Section 3.18. Dispatch Instructions under this section shall only occur during scarcity conditions, as specified in Protocol Section 6.5.9.4.2, EEA Levels, or in an attempt to recover frequency to meet NERC Standards; and/orDispatch Instruction for deployment of Load Resources energy via electronic Messaging System. |