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| NOGRR Number | [187](http://www.ercot.com/mktrules/issues/NOGRR187) | NOGRR Title | Related to NPRR863, Creation of ERCOT Contingency Reserve Service and Revisions to Responsive Reserve |
| Date Posted | March 6, 2019 |
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| Requested Resolution  | Normal |
| Nodal Operating Guide Sections Requiring Revision  | 1.4, Definitions2.2.4, Load Frequency Control2.2.4.1, Maintenance and Verification2.2.4.2,Regulation Provider Loss of AGC2.3, Ancillary Services2.3.1.2, Additional Operational Details for Responsive Reserve Providers2.3.1.2.1 Limit on Generation Resources and Controllable Load Resources Providing RRS (new)2.3.3, ERCOT Contingency Reserve Service (ECRS) (new)2.3.3.1, Additional Operational Details for ECRS Providers (new)3.4, Load Resource Testing Requirement4.5.2, Operating Procedures4.8, Responsive Reserve Service During Scarcity Conditions4.8.1, Responsive Reserve Service Manual Deployment8F, Seasonal Hydro Responsive Reserve Net Capability Verification8G, Load Resource Tests9.4.6, Resource-Specific ERCOT Contingency Reserve Service Performance (new) |
| Related Documents Requiring Revision/Related Revision Requests | Nodal Protocol Revision Request (NPRR) 863, Creation of ERCOT Contingency Reserve Service and Revisions to Responsive Reserve |
| Revision Description | This Nodal Operating Guide Revision Request (NOGRR) aligns the Nodal Operating Guide with revisions to Ancillary Services proposed by NPRR863. |
| Reason for Revision |  Addresses current operational issues. Meets Strategic goals (tied to the [ERCOT Strategic Plan](http://www.ercot.com/content/news/presentations/2013/ERCOT%20Strat%20Plan%20FINAL%20112213.pdf) or directed by the ERCOT Board). Market efficiencies or enhancements Administrative Regulatory requirements Other: (explain)*(please select all that apply)* |
| Business Case | Alignment between the Protocols and Market Guides are necessary and proper. |

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| Sponsor |
| Name | Clif Lange |
| E-mail Address | clif@stec.org |
| Company | South Texas Electric Coop., Inc. (STEC) |
| Phone Number | 361-485-6206 |
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| Market Segment | Cooperative |

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| --- |
| **Market Rules Staff Contact** |
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| Proposed Guide Language Revision |

1.4 Definitions

Automatic Generation Control (AGC)

Application that receives signals from ERCOT for Regulation deployment and causes Generation Resources providing these Ancillary Services to respond in accordance with their participation factor and ramp rate to meet the received deployments.

***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 energy, and release Responsive Reserve (RRS) and ERCOT Contingency Reserve Service (ECRS) capacity to SCED, 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.

**2.2.4.1 Maintenance and Verification**

(1) Each provider of Regulation will properly maintain AGC equipment. Performance of AGC will be verified by the results of performance metrics for Ancillary Service providers described in the Protocols. ERCOT will initiate a regulation survey to evaluate the performance of all AGC equipment in the ERCOT Region.

**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. Possible ERCOT actions include opening a Supplemental Ancillary Service Market (SASM) per Protocol Section 6.4.8.2, Supplemental Ancillary Service Market, for the period of anticipated loss.

**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)andRegulation 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 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 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-DownandReg-Up(for Load Resource)***Reference: Protocol Section******2, Definitions and Acronyms*** | Load Resource capacity provided by a QSE from a specific Load Resource to control frequency within the system. | a. Reg-Down is a deployment to increase or decrease Load as deployed within its Ancillary Service Schedule for Reg-Down below the Load Resource’s Maximum Power Consumption (MPC) limit in response to a change in system frequency.b. Reg-Up is a deployment to increase or decrease Load as deployed within its Ancillary Service Schedule for Reg-Up 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, Definitions and Acronyms*** | 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; andc. As ordered by an ERCOT Operator during an EEA or other emergencies. |
| ERCOT Contingency Reserve Service (ECRS)***Reference: Protocol Section******2, Definitions and Acronyms*** | a. Off-Line Generation Resource capacity, or reserved capacity from On-Line Generation Resources, capable of being ramped to a specified output level within ten minutes, and operating at a specified output for the entire duration of the ECRS obligation and are dispatchable by SCED.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 for the entire duration of the ECRS obligation.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 the entire duration of the ECRS obligation. | 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, Definitions and Acronyms*** | 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 for the entire duration of the Non-Spin obligation. 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 the entire duration of the Non-Spin obligation. | 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. |

**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 a Verbal Dispatch Instruction (VDI) to QSEs of Generation Resources operating in synchronous condenser fast-response mode who provide MWs to the ERCOT System in response to a frequency event occurring at or below the frequency set point specified in paragraph (3)(b) of Protocol Section 3.18 when the energy is provided without an RRS deployment. The VDI shall be in the quantity of MWs (energy) supplied by the Generation Resource responding in synchronous condenser fast-response mode and shall relieve the QSE of its obligation for the equivalent RRS obligation quantity. If ERCOT issues an RRS deployment to the QSE responding with Generation Resources operating in synchronous condenser fast-response mode, ERCOT shall count the responding Generation Resource(s) MWs (energy) as part of its response to the RRS deployment.

(4) Unless ERCOT issues a recall instruction for the RRS deployed via Inter-Control Center Communications Protocol (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) 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) Each QSE providing RRS with Resources capable of providing FFR shall so indicate by appropriate entries in the relevant Resources’ Ancillary Service Schedules and by setting the Ancillary Service Resource Responsibilities accordingly. 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 Resource Responsibility 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 Resource Responsibility in 15 cycles after the frequency reached 59.85 Hz;

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

(iv) The Resource restored its capability to provide its Ancillary Service Resource Responsibility within 15 minutes from the end of the deployment period subject to paragraph (v) below; and

(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, it must ramp down to zero output level over the duration of five minutes.  A Resource providing FFR may withdraw energy from the grid only after the frequency has recovered to 60 Hz and Physical Responsive Capability (PRC) is above 2,500 MW, unless ordered to do so by ERCOT.

(d) For an FFR deployment 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 Resource Responsibility within ten minutes after the start of the ramp period;

(ii) The Resource sustained 95% to 110% of its Ancillary Service Resource Responsibility 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) The Resource restored its capability to provide its Ancillary Service Resource Responsibility within 15 minutes after ERCOT declares that the EEA has been cancelled; and

(iv) Upon completion of deployment, ERCOT will issue a recall instruction to a Resource providing FFR.  A Resource providing FFR may withdraw energy from the grid only after the frequency has recovered to 60 Hz and Physical Responsive Capability (PRC) is above 2,500 MW, unless ordered to do so by ERCOT.

(e) For a Resource providing FFR that is unable to return to its RRS Ancillary Service Resource Responsibility within 15 minutes from the end of the deployment period, its QSE may replace the quantity of deficient FFR capacity within that same 15 minutes using other Resources qualified to provide RRS but not already committed to provide RRS.

(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.

2.3.1.2.1 Limit on Generation Resources and Controllable Load Resources Providing RRS

(1) ERCOT shall establish MW limits on individual Resource’s ability to provide RRS using Primary Frequency Response. The MW limit shall be based on Generating Resource and Controllable Load Resource performance during Frequency Measurable Events (FME).

(2) ERCOT shall develop a TAC-approved procedure that describes the methodology to calculate the MW limit on individual Resources using the Resource’s actual performance during FMEs.

(3) The default maximum MW limit of PFR shall be set to 20% of its HSL for any newly RRS-qualified Generation Resource or Generation Resource not yet evaluated per the TAC-approved methodology for measuring actual performance.

(4) 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.

(5) ERCOT shall post to the MIS Certified Area the MW limit on each Resource providing RRS by 20th day of each quarter for the upcoming quarter. For example, for the first quarter of a given year, ERCOT shall post the MW limit by October 20th of the previous year.

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 the entire duration of its ECRS obligation.

(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 the entire duration of its ECRS obligation.

(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 one or more of the following:

(a) Automatic Dispatch Instruction signal to release ECRS capacity from Generation Resources and Controllable Load Resources to SCED; and/or

(b) Dispatch Instruction for deployment of Load Resources energy via electronic Messaging System.

(7) ERCOT shall release ECRS from Generation Resources and Controllable Load Resources to SCED when frequency drops below 59.91 Hz and available Reg-Up alone is not sufficient to restore frequency. ERCOT shall recall automatically deployed ECRS capacity once system frequency recovers above 59.97 Hz.

**3.4 Load Resource Testing Requirement**

(1) After initial qualification, a Load Resource’s telemetry shall be evaluated annually and applicable relay functionality will be tested and validated by ERCOT every 24 months as required by these Operating Guides. In addition, ERCOT shall annually verify the telemetry attributes of each Load Resource providing ERCOT Contingency Reserve Service (ECRS) or Responsive Reserve (RRS) using high-set under-frequency relay. If a Load Resource fails to provide the appropriate documents as required in the annual and biennial verification test for two consecutive years, ERCOT shall notify the associated Qualified Scheduling Entity (QSE) of non-compliance. After a 30-day allowance for the deficiency to be corrected, ERCOT shall reduce the Resource’s ability to provide Ancillary Services in the ERCOT market to zero.

***4.5.2 Operating Procedures***

(1) The ERCOT System Operators have the authority to make and carry through decisions that are required to operate the ERCOT System during emergency or adverse conditions. ERCOT will have sufficiently detailed operating procedures for emergency or short supply situations and for restoration of service in the event of a Partial Blackout or Blackout. These procedures will be distributed to the personnel responsible for performing specified tasks to handle emergencies, remedy short supply situations, or restore service. Transmission Service Providers (TSPs) will develop procedures to be filed with ERCOT describing implementation of ERCOT requests in emergency and short supply situations, including interrupting Load, notifying others and restoration of service.

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| ***[NOGRR177: Replace paragraph (1) above with the following upon system implementation of NPRR857:]***(1) The ERCOT System Operators have the authority to make and carry through decisions that are required to operate the ERCOT System during emergency or adverse conditions. ERCOT will have sufficiently detailed operating procedures for emergency or short supply situations and for restoration of service in the event of a Partial Blackout or Blackout. These procedures will be distributed to the personnel responsible for performing specified tasks to handle emergencies, remedy short supply situations, or restore service. Transmission Service Providers (TSPs) and Direct Current Tie Operators (DCTOs) will develop procedures to be filed with ERCOT describing implementation of ERCOT requests in emergency and short supply situations, including interrupting Load, notifying others and restoration of service. |

(2) ERCOT and each TSP will endeavor to maintain transmission ties intact if at all possible. This will:

(a) Permit rendering the maximum assistance to an area experiencing a deficiency in generation;

(b) Minimize the possibility of cascading loss to other parts of the system; and

(c) Assist in restoring operation to normal.

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| ***[NOGRR177: Replace paragraph (2) above with the following upon system implementation of NPRR857:]***(2) ERCOT and Transmission Operators (TOs) will endeavor to maintain transmission ties intact if at all possible. This will: (a) Permit rendering the maximum assistance to an area experiencing a deficiency in generation;(b) Minimize the possibility of cascading loss to other parts of the system; and (c) Assist in restoring operation to normal.  |

(3) ERCOT's operating procedures will meet the following goals while continuing to respect the confidentiality of market sensitive data. If all goals cannot be respected simultaneously then the priority order listed below shall be respected:

(a) Maintain station service for nuclear generating facilities;

(b) Securing startup power for power generating plants;

(c) Operating generating plants isolated from ERCOT without communication;

(d) Restoration of service to critical Loads such as:

(i) Military facilities;

(ii) Facilities necessary to restore the electric utility system;

(iii) Law enforcement organizations and facilities affecting public health; and

(iv) Communication facilities.

(e) Maximum utilization of ERCOT System capability;

(f) Utilization of Ancillary Services to the extent permitted by ERCOT System conditions;

(g) Utilization of the market to the fullest extent practicable without jeopardizing the reliability of the ERCOT System;

(h) Restoration of service to all Customers following major system disturbances, giving priority to the larger group of Customers; and

(i) Management of Interconnection Reliability Operating Limits (IROLs) shall not change.

**4.8 Responsive Reserve Service During Scarcity Conditions**

(1) This Section details how Responsive Reserve (RRS) service may be manually deployed, also referred to as release of High Ancillary Service Limit (HASL), during scarcity conditions, pursuant to Protocol Section 6.5.7.6.2.2, Deployment of Responsive Reserve Service. The existing measure of scarcity is Physical Responsive Capability (PRC). If PRC drops below 3,000 MW, and all available ECRS (dispatchable by SCED) and NSRS has been deployed, this process may be used. Scarcity conditions may occur during the Peak Load Season when ERCOT System Load is above 60,000 MW. For all other months, they could occur when ERCOT System Load is above 50,000 MW.

***4.8.1 Responsive Reserve Service Manual Deployment***

(1) RRS for capacity may be manually deployed (HASL released) when the system approaches scarcity conditions so that the capacity reserved behind HASL will be released to Security-Constrained Economic Dispatch (SCED). The capacity may be released under any of the following conditions:

(a) When HASL – (Gen + 5 minute load ramp) <= 200 MW, deploy 500 MW of the available RRS capacity from Generation Resources and Controllable Load Resources after all the available ECRS (dispatchable by SCED) and Non-Spinning Reserve (Non-Spin) service has been deployed;

(b) Additional RRS capacity from Generation Resources and Controllable Load Resources may be deployed in 500 MW increments, as available, when HASL – (Gen + 5 minute load ramp) <= 200 MW and Resources have responded to any earlier deployments; or

(c) When PRC <= 2,000 MW, release all remaining RRS capacity from Generation Resources and Controllable Load Resources after all the available ECRS and Non-Spin has been deployed.

**ERCOT Nodal Operating Guides**

**Section 8**

**Attachment F**

**Seasonal Generation Resource Operating in Synchronous Condenser Fast-Response ModeResponsive Reserve Net Capability Verification**

**TBD**

***Seasonal Generation Resource Operating in Synchronous Condenser Fast-Response Mode Responsive Reserve Net Capability Verification***

***General Information***

Unit Code (16 character): Location (County):

Unit Name: Date of test:

Generator’s QSE: Resource Entity:

***Test Details***

Start Time

Start MW

MW at 20 seconds

Max MW

***Submittal***

Resource Entity Representative:

QSE Representative:

Date submitted to ERCOT Rep.:

**ERCOT Nodal Operating Guides**

**Section 8**

**Attachment G**

**Load Resource Tests**

**TBD**

***Annual Load Resource Telemetry Test***

***General Information***

Date: Location (County):

ERCOT Asset Code: Load Resource’s QSE:

Load Resource Name: Load Point Name:

 (multiple points only)

***For Test Details Reference Section 3.4, Load Resource Testing Requirement.***

***Telemetry Test Results***

Start Time Interval:

Load Resource Breaker Status: Response MW:

UFR Status\*: MW at Maximum Load\*\*:

Note: \* Only applicable to Load Resources providing Responsive Reserve (RRS) or ERCOT Contingency Reserve Service (ECRS)

\*\* Maximum available capacity for each Load Resources will be capped to the Maximum Load test level

By signature below, the Load Resource Representative certifies that the telemetry and high set under frequency relays, where applicable, are in place and fully functional.

***Submittal***

Load Resource Representative Name:

Signature:

QSE Representative: Date submitted to ERCOT:

***ERCOT Validation By: Date:***

***Biennial Test for Load Resources Providing Responsive Reserve Service***

***General Information***

Date: Location (County):

ERCOT Asset Code: Load Resource’s QSE:

Load Resource Name: Load Point Name:

 (multiple points only)

***Instructions***

As specified in Protocol Section 8.1.1.2, General Capacity Testing Requirements, a Load Resource providing Responsive Reserve Service shall test each under frequency relay or solid state controller, whichever applies, for correct operation. A separate certified relay test results sheet is to be attached for each relay tested. Please provide sufficient notation on each test sheet to assist ERCOT in matching up the sheet to individual relays. This test of the under frequency relay does not require the Load to be interrupted. If, within the biennial testing period, the Load’s performance has been verified through the correct response to an actual event, the data from that event can be supplied to meet this requirement and the required annual telemetry test. The date, interval, and other information associated with the event are to be noted below. ERCOT will return a copy of the validated test form to the QSE.

***Verification of telemtered Response to an Actual Event***

Date of event: Interval of event:

Load Resource Breaker Status: MW Load Prior to Event:

UFR Status: Instantaneous Response MW: Frequency deviation Hz:

Time Load restored: ERCOT Operator:

***Submittal***

By signature below the Load Resource representative certifies the high set under frequency relay(s) are in place and fully functional.

Load Resource Representative Name:

Signature:

Name of Company Performing Relay Test:

QSE Representative: Date submitted to ERCOT:

ERCOT Validation By: Date:

**Note: Please attach certified relay test results sheet(s) to this form when submitting to ERCOT.**

9.4.6 Resource-specific ERCOT Contingency Reserve Service

(1) ERCOT shall develop monthly reports detailing Resource-specific ERCOT Contingency Reserve Service (ECRS) performance during deployments, including Load Resources, based on the criteria described in Protocol Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria.