(c) Other ways of temporarily increasing the output of Combined Cycle Generation Resources; and

(d) For Qualifying Facilities (QFs), an LSL that represents the minimum energy available for Dispatch by SCED, in MW, from the Combined Cycle Generation Resource based on the minimum stable steam delivery to the thermal host plus a justifiable reliability margin that accounts for changes in ambient conditions.

(11) A QSE representing Generation Resources other than Combined Cycle Generation Resources may telemeter an NFRC value for their Generation Resource only if the QSE or Resource Entity associated with that Generation Resource has first requested and obtained ERCOT's approval of the Generation Resource's NFRC quantity.

[NPRR1010, NPRR1014, and NPRR1029: Replace applicable portions of paragraph (11) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation for NPRR1014 or NPRR1029:]

(11) A QSE representing a Generation Resource other than a Combined Cycle Generation Resource may provide FRC telemetry for the Generation Resource only if the QSE or Resource Entity associated with that Generation Resource has first requested and obtained ERCOT's approval.

(12) A QSE representing an ESR shall provide the following Real-Time telemetry data to ERCOT for each ESR:

(a) Maximum Operating State of Charge, in MWh;

(b) Minimum Operating State of Charge, in MWh;

(c) State of Charge, in MWh;

(d) Maximum Operating Discharge Power Limit, in MW; and

(e) Maximum Operating Charge Power Limit, in MW.

(13) In accordance with ERCOT Protocols, NERC Reliability Standards, and Governmental Authority requirements, ERCOT shall make the data specified in paragraph (12) available to any requesting TSP or DSP at the requesting TSP's or DSP's expense.

[NPRR1077: Insert paragraphs (14)-(16) below upon system implementation:]

(14) Except as provided in paragraph (15) below, a QSE representing a Settlement Only Generator (SOG) shall provide ERCOT the following Real-Time telemetry:

(a) Net real power injection at the Point of Interconnection (POI) or Point of Common Coupling (POCC) for each site with one or more SOGs;

(b) For any site with one or more ESSs that are registered as an SOG, net real power withdrawal at the POI or POCC;

(c) For each inverter at the site, gross real power output measured at the generator terminals for all SOGs that are located behind that inverter, separately aggregated by fuel type;

(d) For SOGs at the same site that are not located behind an inverter, gross real power output measured at the generator terminals for all SOGs, separately aggregated by fuel type;

(e) For any site with one or more ESSs registered as an SOG, for each inverter, gross real power withdrawal by all such ESSs that are located behind that inverter, as measured at the generator terminals; and

(f) Generator breaker status.

(15) A QSE is not required to provide telemetry for a Settlement Only Distribution Generator (SODG) if:

(a) The site that includes the SODG has not exported more than 10 MWh in any calendar year, exclusive of any energy exported during any Settlement Interval in which an ERCOT-declared Energy Emergency Alert (EEA) is in effect;

(b) The QSE or Resource Entity for the SODG has submitted a written request to ERCOT seeking an exemption from the telemetry requirements under this paragraph; and

(c) ERCOT has provided the QSE or Resource Entity written confirmation that the SODG is exempt from providing telemetry under this paragraph.

(16) If ERCOT determines that a site that includes an SODG has exported more than 10 MWh in a given calendar year, it shall notify the SODG's QSE that the SODG is no longer eligible for the telemetry exemption. Within 90 days of receiving this notification, the QSE for the SODG shall comply with the telemetry requirements of paragraph (14) above.

[NPRR885: Insert paragraph (17) below upon system implementation:]

(17) A QSE representing a Must-Run Alternative (MRA) shall telemeter the MRA MW currently available (unloaded) and not included in the HSL.

[NPRR1029: Insert paragraph (18) below upon system implementation:]

(18) A QSE representing a DC-Coupled Resource shall provide the following Real-Time telemetry data in addition to that required for other ESRs:

(a) Gross AC MW production of the intermittent renewable generation component of the DC-Coupled Resource, which includes the portion of the intermittent renewable generation used to charge the ESS and/or serve auxiliary Load on the DC side of the inverter; and

(b) Gross AC MW capability of the intermittent renewable generation component of the DC-Coupled Resource, based on Real-Time conditions.

[NPRR995: Insert paragraph (19) below upon system implementation:]

(19) A QSE representing a Settlement Only Energy Storage System (SOESS) that elects to include the net generation and/or net withdrawals of the SOESS in the estimate of Real-Time Liability (RTL) shall provide ERCOT Real-Time telemetry of the net generation and/or net withdrawals of the SOESS.

6.5.6 TSP and DSP Responsibilities

(1) Each TSP shall notify ERCOT of any changes in status of Transmission Elements as provided in these Protocols and clarified in the ERCOT procedures.

(2) Each TSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum TSP reactive requirements.

(3) Each DSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum DSP reactive requirements.

[NPRR1098: Replace Section 6.5.6 above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross Transmission LLC (Southern Cross) provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a Transmission Service Provider (TSP) and the TSP gives ERCOT written notice that Southern Cross has provided

it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

6.5.6 TSP, TO, DCTO, and DSP Responsibilities

(1) Each TSP shall notify ERCOT of any changes in status of Transmission Elements as provided in these Protocols and clarified in the ERCOT procedures.

(2) Each TSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum TSP reactive requirements.

(3) Each DSP shall as soon as practicable report to ERCOT any short-term inability to meet minimum DSP reactive requirements.

(4) Each DCTO shall immediately notify its designated TO of any change that affects the reactive capability of any DC Tie Facility it operates, including any change to the operation mode of the DC Tie Facility's voltage control system or any temporary transmission voltage limit changes. Each TO designated by a DCTO shall immediately notify ERCOT when a DC Tie Facility experiences a change that affects its reactive capability, including any change to the operation mode of the DC Tie Facility's voltage control system or any temporary transmission voltage limit changes.

(5) Each TO designated by a DCTO operating a DC Tie meeting the applicability requirements of paragraph (1) of Section 3.15.4, Direct Current Tie Owner and Direct Current Tie Operator (DCTO) Responsibilities Related to Voltage Support, shall for each such DC Tie provide to ERCOT, via ICCP, the status of the DC Tie Facility's voltage control system. An "On" status will indicate that the control system is on and set to regulate the voltage at the DC Tie's POIB in automatic voltage control mode, and an "Off" status will indicate that the control system is off or in manual mode.

(6) Each TO designated by a DCTO operating a DC Tie meeting the applicability requirements of paragraph (1) of Section 3.15.4 shall telemeter to ERCOT, via ICCP, the Real-Time target voltage at each DC Tie's POIB. Each TO shall modify the telemetered target voltage to match any verbal target voltage instruction issued as soon as practicable.

6.5.7 Energy Dispatch Methodology

(1) This Section outlines the programmatic and manual processes employed by ERCOT to simultaneously achieve power balance (minimizing the use of Regulation Service) and manage congestion while operating within the constraints of the system at economically optimized cost. The Real-Time Sequence describes the key system components and inputs that are required to support the SCED process, which produces the Locational Marginal Prices (LMPs) and Base Points while meeting transmission system constraints.

Section 6.5.7.3, Security Constrained Economic Dispatch, provides further details regarding additional components and inputs and ex-ante mitigation.

[NPRR1010: Replace Section 6.5.7 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.5.7 Real-Time Sequence Methodology

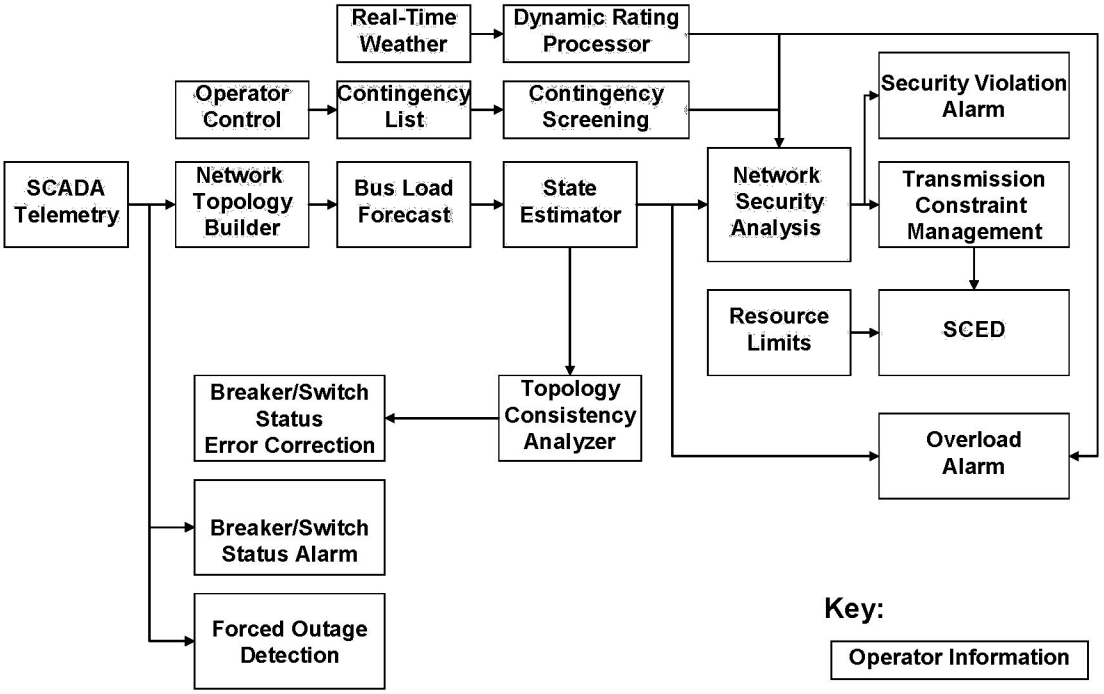
(1) This Section outlines the programmatic and manual processes employed by ERCOT to simultaneously achieve power balance (minimizing the use of Regulation Service), determine Ancillary Service awards, and manage congestion while operating within the constraints of the system at economically optimized cost. The Real-Time Sequence describes the key system components and inputs that are required to support the SCED process, which produces the Locational Marginal Prices (LMPs), Base Points, Real-Time MCPCs, and Ancillary Service awards while meeting transmission system constraints. Section 6.5.7.3, Security Constrained Economic Dispatch, provides further details regarding additional components and inputs and ex-ante mitigation.

6.5.7.1 Real-Time Sequence

(1) The Real-Time Sequence consists of multiple interdependent processes that are driven by telemetry data and the network topology. This Section describes the core aspects of the Real-Time Sequence.

(2) The figure below highlights the key computational modules and processes that are used during the Real-Time Sequence:

Real-Time Network Security Analysis



6.5.7.1.1 SCADA Telemetry

(1) SCADA telemetry provides the actual Real-Time status and output of Resources and the status of observable Transmission Elements of the Network Operations Model.

6.5.7.1.2 Network Topology Builder

(1) The Network Topology Builder creates the Updated Network Model based on the observed topology of the ERCOT Transmission Grid. The Updated Network Model is then used as the basis for the State Estimator solution.

6.5.7.1.3 Bus Load Forecast

(1) Once the Updated Network Model is created, the transmission Electrical Buses in the model will have a Bus Load Forecast applied. The forecasted Load must be denoted with a low State Estimator measurement confidence factor. The State Estimator must use the forecasted Load coupled with the remaining telemetry of line flows and voltages to estimate the actual Load on each Electrical Bus.

6.5.7.1.4 State Estimator

(1) The State Estimator must use the Bus Load Forecast and the remaining telemetry information of line flows and voltages to estimate all the transmission parameters needed to provide, on convergence, a mathematically consistent data set of constrained inputs to the Network Security Analysis (NSA) and the Topology Consistency Analyzer.

6.5.7.1.5 Topology Consistency Analyzer

(1) The Topology Consistency Analyzer identifies possibly erroneous breaker and switch status. The Topology Consistency Analyzer must notify ERCOT of inconsistencies detected and must indicate the correct breaker and switch status(es) when the preponderance of redundant information from the telemetered database indicates true errors in status. For example, such processing would detect flow on lines, flow on devices or network load, shown as disconnected from the transmission system and would indicate to ERCOT that there was a continuity error associated with the flow measurement or status indication. ERCOT may override SCADA telemetry as required to correct erroneous breaker and switch status before that information is processed by the NSA for the next SCED interval. ERCOT shall notify the TSP or QSE, who shall correct the status indications as soon as practicable. The Topology Consistency Analyzer maintains a summary of all incorrect status indicators and provides that information to all TSPs and other Market Participants through the MIS Secure Area.

[NPRR857: Replace paragraph (1) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(1) The Topology Consistency Analyzer identifies possibly erroneous breaker and switch status. The Topology Consistency Analyzer must notify ERCOT of inconsistencies detected and must indicate the correct breaker and switch status(es) when the preponderance of redundant information from the telemetered database indicates true errors in status. For example, such processing would detect flow on lines, flow on devices or network load, shown as disconnected from the transmission system and would indicate to ERCOT that there was a continuity error associated with the flow measurement or status indication. ERCOT may override SCADA telemetry as required to correct erroneous breaker and switch status before that information is processed by the NSA for the next SCED interval. ERCOT shall notify the TSP, DCTO, or QSE, who shall correct the status indications as soon as practicable. The Topology Consistency Analyzer maintains a summary of all incorrect status indicators

and provides that information to all TSPs, DCTOs, and other Market Participants through the MIS Secure Area.

6.5.7.1.6 Breakers/Switch Status Alarm Processor and Forced Outage Detection Processor

(1) The Real-Time Sequence includes processes that detect and provide alarms to the ERCOT Operator when the status of breakers and switches, Resources, transmission lines and transformers, and Load disconnected from the Updated Network Model changes. Also, the ERCOT Operator must be able to determine if an Outage of Transmission Facilities had been scheduled in the Outage Scheduler or is a Forced Outage.

6.5.7.1.7 Real-Time Weather and Dynamic Rating Processor

(1) The Dynamic Rating Processor provides Dynamic Ratings using the processes described in Section 3.10.8, Dynamic Ratings, for all transmission lines and transformer elements with Dynamic Ratings designated by the TSPs. ERCOT shall obtain Real-Time weather data, where available, from multiple locations and provide it to the Dynamic Rating Processor. Weather conditions must include ambient temperature and may include wind speed when available. ERCOT shall post summaries of dynamically adjusted Transmission Element limits on the MIS Secure Area in a form that allows Market Participants to directly upload Real-Time data into the Common Information Model (CIM).

(2) On a monthly basis, ERCOT shall provide a summary report for each dynamically rated Transmission Element specifying the average change in Normal Rating in MVA that is gained on the element through use of a Dynamic Rating rather than the Normal Rating. ERCOT shall post this report to the MIS Secure Area.

6.5.7.1.8 Overload Alarm Processor

(1) Once transmission line and transformer Dynamic Ratings are retrieved, ERCOT shall compare the actual flow and state estimated flow calculation of MVA to the effective Transmission Element limit and, if an out-of-limit condition exists, ERCOT shall produce an overload notification.

6.5.7.1.9 Contingency List and Contingency Screening

(1) For the Real-Time Sequence, ERCOT may select relevant contingencies from a standard contingency list previously developed by ERCOT under Section 5.5.1, Security

Sequence, that are likely to be active in Real-Time. ERCOT may use the information provided by the hour-ahead or Day-Ahead NSA to assist in determining which contingencies are candidates for activation.

6.5.7.1.10 Network Security Analysis Processor and Security Violation Alarm

(1) Using the input provided by the State Estimator, ERCOT shall use the NSA processor to perform analysis of all contingencies in the active list. For each contingency, ERCOT shall use the NSA processor to monitor the elements for limit violations. ERCOT shall use the NSA processor to verify Electrical Bus voltage limits to be within a percentage tolerance as outlined in the Operating Guides. Contingency security violations for transmission lines and transformers occur if:

(a) The predicted post-contingency MVA exceeds 100% of the Emergency Rating after consideration of Dynamic Ratings; and

(b) A RAP, AMP or RAS is not defined allowing relief within the time allowed by the security criteria as defined in Operating Guide Section 2.2.2, Security Criteria.

(2) When the NSA processor notifies ERCOT of a security violation, ERCOT shall immediately:

(a) Initiate the process described in Section 6.5.7.1.11, Transmission Network and Power Balance Constraint Management;

(b) Seek to determine what unforeseen change in system condition has arisen that has resulted in the security violation, especially those that were 125% or greater of the Emergency Rating for a single SCED interval or greater than 100% of the Emergency Rating for a duration of 30 minutes or more; and

(c) Where possible, seek to reverse the action (e.g. initiating a transmission clearance that the system was not properly pre-dispatched for) that has led to a security violation until further preventative action(s) can be taken.

(3) If SCED does not resolve a transmission security violation, ERCOT shall attempt to relieve the security violation by:

(a) Confirming that pre-determined RAPs are properly modeled in the system;

(b) Instructing Resources to follow Base Points from SCED if those Resources are not already doing so;

(c) Instructing Resources to update the Resources Status in the COP from ONTEST to ON in order to provide more capacity to SCED;

(d) Deploying Resource-Specific Non-Spin;

(e) Committing additional Generation Resources through the Reliability Unit Commitment (RUC) process;

(f) Removing conflicting non-cascading constraints from the SCED process;

(g) Re-Dispatching generation by over-riding HDLs and LDLs;

[NPRR1014: Replace paragraph (g) above with the following upon system implementation:]

(g) Re-Dispatching generation or, in the case of an ESR, its output or consumption, by over-riding HDLs and LDLs;

(h) Instructing TSPs to utilize Reactive Power devices to manage voltage; and

(i) If all other mechanisms have failed, ERCOT may authorize the expedited use of a Temporary Outage Action Plan (TOAP) or Mitigation Plan.

(4) NSA must be capable of analyzing contingencies, including the effects of RASs, AMPs and RAPs modeled in the Network Operations Model. The NSA must fully integrate the evaluation and deployment of RASs, AMPs and RAPs and notify the ERCOT Operator of the application of these RASs, AMPs and RAPs to the solution.

(5) The Real-Time NSA may employ the use of appropriate ranking and other screening techniques to further reduce computation time by executing one or two iterations of the contingency study to gauge its impact and discard further study if the estimated result is inconsequential.

(6) HDL or LDL overrides required to pre-posture for an expected Outage shall only be utilized until SCED is capable of managing the related constraint by economic dispatch.

(7) ERCOT shall report monthly:

(a) All security violations that were 125% or greater of the Emergency Rating for a single SCED interval or greater than 100% of the Emergency Rating for a duration of 30 minutes or more during the prior reporting month and the number of occurrences and congestion cost associated with each of the constraints causing the security violations on a rolling 12 month basis.

(b) Operating conditions on the ERCOT System that contributed to each transmission security violation reported in paragraph (7)(a) above. Analysis should be made to understand the root cause and what steps could be taken to avoid a recurrence in the future.

6.5.7.1.11 Transmission Network and Power Balance Constraint Management

(1) ERCOT may not allow any constraint (contingency and limiting Transmission Element pair) identified by NSA to be activated in SCED until it has verified that the contingency definition in NSA associated with the constraint is accurate and appropriate given the current operating state of the ERCOT Transmission Grid. ERCOT shall continuously post to the MIS Secure Area all constraint contingencies in the NSA. ERCOT shall provide relevant constraint information, including, but not limited to, the contingency name as provided in the standard contingency list, whether or not the constraint is active in SCED, the overloaded Transmission Element name, the Rating of the overloaded Transmission Element including Generic Transmission Limits (GTLs) expressed in MW and MVA, and pre-contingency or post-contingency flows expressed in MW and MVA. For each Operating Day, ERCOT shall post to the MIS Secure Area within five days, a report listing all constraints with pre-contingency or post-contingency flows which exceeded the Rating of the overloaded Transmission Element for at least 15 minutes consecutively that were not activated in SCED and an explanation of why each constraint was not activated.

(2) ERCOT shall establish a maximum Shadow Price for each network constraint as part of the definition of contingencies. The cost calculated by SCED to resolve an additional MW of congestion on the network constraint is limited to the maximum Shadow Price for the network constraint.

(3) ERCOT shall establish a maximum Shadow Price for the power balance constraint. The cost calculated by SCED to resolve either the addition or reduction of one MW of dispatched generation on the power balance constraint is limited to the maximum Shadow Price for the power balance constraint.

(4) ERCOT shall determine the methodology for setting maximum Shadow Prices for network constraints and for the power balance constraint. Following review and recommendation by the Technical Advisory Committee (TAC), the ERCOT Board shall review the recommendation and approve a final methodology.

(5) The process for setting the maximum Shadow Prices as described above shall require ERCOT to obtain ERCOT Board approval of the values assigned to these caps along with the effective date for application of the cap. Within two Business Days following approval by the ERCOT Board, ERCOT shall post the Shadow Price caps and effective dates on the ERCOT website.

(6) If ERCOT determines that rating(s) in the Network Operations Model or configuration of the Transmission Facilities are not correct, then the TSP will provide the appropriate data submittals to ERCOT to correct the problem upon notification by ERCOT.

[NPRR857: Replace paragraph (6) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(6) If ERCOT determines that rating(s) in the Network Operations Model or configuration of the Transmission Facilities are not correct, then the TSP or DCTO will provide the appropriate data submittals to ERCOT to correct the problem upon notification by ERCOT.

6.5.7.1.12 Resource Limits

(1) The following Generation Resource limits are calculated by ERCOT and used as inputs by the SCED process:

(a) HASL;

(b) LASL;

(c) Normal Ramp Rate based on the values telemetered by the QSE to ERCOT;

(d) Emergency Ramp Rate based on the values telemetered by the QSE to ERCOT;

(e) SCED Up Ramp Rate (SURAMP), which represents the ability of a Generation Resource to increase generation output in SCED;

(f) SCED Down Ramp Rate (SDRAMP), which represents the ability of a Generation Resource to decrease generation output in SCED;

(g) HDL, which represents a dynamically calculated MW upper limit on a Resource that describes the maximum capability of the Resource SCED dispatch for the next five minutes (the Resource's Real-Time generation plus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by HASL; and

(h) LDL, which represents a dynamically calculated MW lower limit on a Resource that describes the minimum capability of the Resource SCED dispatch for the next five minutes (the Resource's Real-Time generation minus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by LASL.

(2) The following Load Resource limits are calculated by ERCOT and used in other calculations and as information for ERCOT Operators:

(a) For all Load Resources:

(i) HASL; and

(ii) LASL; and

(b) For Controllable Load Resources qualified to be Dispatched by SCED:

(i) Normal Ramp Rate based on the values telemetered by the QSE to ERCOT;

(ii) Emergency Ramp Rate based on the values telemetered by the QSE to ERCOT;

(iii) SURAMP, which represents the ability of a Load Resource to decrease consumption in SCED;

(iv) SDRAMP, which represents the ability of a Load Resource to increase consumption in SCED;

(v) HDL, which represents a dynamically calculated MW upper limit on a Resource that describes the maximum capability of the Resource SCED dispatch for the next five minutes (the Resource's Real-Time consumption plus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by HASL; and

(vi) LDL, which represents a dynamically calculated MW lower limit on a Resource that describes the minimum capability of the Resource SCED dispatch for the next five minutes (the Resource's Real-Time consumption minus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by LASL.

(3) For a more detailed explanation of all the Resource limits calculated by ERCOT, please reference Section 6.5.7.2, Resource Limit Calculator.

[NPRR1010 and NPRR1014: Replace applicable portions of Section 6.5.7.1.12 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation for NPRR1014:]

6.5.7.1.12 Resource Limits

(1) The following Generation Resource or ESR limits are calculated by ERCOT and used as inputs by the SCED process:

(a) Normal Ramp Rate based on the values telemetered by the QSE to ERCOT, which represents the current ability of the Resource to follow a Base Point instruction;

(b) Emergency Ramp Rate based on the values telemetered by the QSE to ERCOT;

(c) HDL, which represents a dynamically calculated MW upper limit on a Resource that describes the maximum capability of the Resource's SCED dispatch and limits the amount of Reg-Up that can be awarded to the Resource for the next five minutes (the Resource's Real-Time generation or, in the case of an ESR, its Real-Time output or consumption, plus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by HSL; and

(d) LDL, which represents a dynamically calculated MW lower limit on a Resource that describes the minimum capability of the Resource's SCED dispatch and limits the amount of Reg-Down that can be awarded to the Resource for the next five minutes (the Resource's Real-Time generation or, in the case of an ESR, its Real-Time output or consumption, minus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by LSL.

(2) The following Load Resource limits are calculated by ERCOT for Controllable Load Resources qualified to be dispatched by SCED and used in other calculations and as information for ERCOT Operators:

(a) Normal Ramp Rate based on the values telemetered by the QSE to ERCOT, which represents the current ability of the Resource to follow a SCED Base Point instruction;

(b) Emergency Ramp Rate based on the values telemetered by the QSE to ERCOT;

(c) HDL, which represents a dynamically calculated MW upper limit on a Resource that describes the maximum capability of the Resource SCED dispatch and limits the amount of Reg-Down that can be awarded to the Resource for the next five minutes (the Resource's Real-Time consumption plus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by HSL; and

(d) LDL, which represents a dynamically calculated MW lower limit on a Resource that describes the minimum capability of the Resource SCED dispatch and limits the amount of Reg-Up that can be awarded to the Resource for the next five minutes (the Resource's Real-Time consumption minus the product of the Normal Ramp Rate, as telemetered by the QSE, multiplied by five), restricted by LSL.

(3) For a more detailed explanation of all the Resource limits calculated by ERCOT, please reference Section 6.5.7.2, Resource Limit Calculator.

6.5.7.1.13 Data Inputs and Outputs for the Real-Time Sequence and SCED

(1) Inputs: The following information must be provided as inputs to the Real-Time Sequence and SCED. ERCOT may require additional information as required, including:

(a) Real-Time data from TSPs including status indication for each point if that data element is stale for more than 20 seconds;

[NPRR857: Replace paragraph (a) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(a) Real-Time data from TSPs and DCTOs including status indication for each point if that data element is stale for more than 20 seconds;

(i) Transmission Electrical Bus voltages;

(ii) MW and MVAr pairs for all transmission lines, transformers, and reactors;

(iii) Actual breaker and switch status for all modeled devices; and

(iv) Tap position for auto-transformers;

(b) State Estimator results (MW and MVAr pairs and calculated MVA) for all modeled Transmission Elements;

(c) Transmission Element ratings from TSPs;

[NPRR857: Replace paragraph (c) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(c) Transmission Element ratings from TSPs and DCTOs;

(i) Data from the Network Operations Model:

(A) Transmission lines – Normal, Emergency, and 15-Minute Ratings (MVA); and

(B) Transformers and Auto-transformers – Normal, Emergency, and 15-Minute Ratings (MVA) and tap position limits;

(ii) Data from QSEs:

(A) Generator Step-Up (GSU) transformers tap position;

(B) Resource HSL (from telemetry); and

(C) Resource LSL (from telemetry); and

(d) Real-Time weather, from Wind-powered Generation Resources (WGRs), and where available from TSPs or other sources. ERCOT may elect to obtain other sources of weather data and may utilize such information to calculate the dynamic limit of any Transmission Element.

[NPRR857: Replace paragraph (d) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(d) Real-Time weather, from Wind-powered Generation Resources (WGRs), and where available from TSPs, DCTOs, or other sources. ERCOT may elect to obtain other sources of weather data and may utilize such information to calculate the dynamic limit of any Transmission Element.

(2) ERCOT shall validate the inputs of the Resource Limit Calculator as follows:

(a) The calculated SURAMP and SDRAMP are each greater than or equal to zero; and

(b) Other provision specified under Section 3.18, Resource Limits in Providing Ancillary Service.

[NPRR1010: Delete paragraph (2) above upon system implementation of the Real-Time Co-Optimization (RTC) project and renumber accordingly.]

(3) Outputs for ERCOT Operator information and possible action include:

(a) Operator notification of any change in status of any breaker or switch;

(b) Lists of all breakers and switches not in their normal position;

(c) Operator notification of all Transmission Element overloads detected from telemetered or State-Estimated data;

(d) Operator notification of all Transmission Element security violations; and

(e) Operator summary displays:

(i) Transmission system status changes;

(ii) Overloads;

(iii) System security violations; and

(iv) Base Points.

(4) Every hour, ERCOT shall post on the MIS Secure Area the following information:

(a) Status of all breakers and switches used in the NSA except breakers and switches connecting Resources to the ERCOT Transmission Grid;

(b) All binding transmission constraints and the contingency or overloaded element pairs that caused such constraint; and

(c) Shift Factors, including Private Use Network Settlement Points, by Resource Node, Hub, Load Zone, and DC Tie.

(5) Sixty days after the applicable Operating Day, ERCOT shall post on the MIS Secure Area, the following information:

(a) Hourly transmission line flows and voltages from the State Estimator, excluding transmission line flows and voltages for Private Use Networks; and

(b) Hourly transformer flows, voltages and tap positions from the State Estimator, excluding transformer flows, voltages, and tap positions for Private Use Networks.

(6) Notwithstanding paragraph (5) above, ERCOT, in its sole discretion, shall release relevant State Estimator data less than 60 days after the Operating Day if it determines

the release is necessary to provide complete and timely explanation and analysis of unexpected market operations and results or system events including, but not limited to, pricing anomalies, recurring transmission congestion, and system disturbances. ERCOT's release of data under this paragraph shall be limited to intervals associated with the unexpected market or system event as determined by ERCOT. The data release shall be made available simultaneously to all Market Participants.

(7) Every hour, ERCOT shall post on the ERCOT website, the sum of ERCOT generation, and flow on the DC Ties, all from the State Estimator.

(8) After every SCED run, ERCOT shall post to the ERCOT website the sum of the HDL and the sum of the LDL for all Generation Resources On-Line and Dispatched by SCED.

(9) Sixty days after the applicable Operating Day, ERCOT shall post to the ERCOT website the summary LDL and HDL report from paragraph (8) above and include instances of manual overrides of HDL or LDL, including the name of the Generation Resource and the type of override.

(10) No sooner than sixty days after the applicable Operating Day, ERCOT shall provide to the appropriate TAC subcommittee instances of manual overrides of HDL or LDL, including the name of the Generation Resource, the reason for the override, and, as applicable, the cost as calculated in Section 6.6.3.6, Real-Time High Dispatch Limit Override Energy Payment.

(11) After every SCED run, ERCOT shall post to the MIS Certified Area, for any QSE, instances of a manual override of the HDL or LDL for a Generation Resource, including the original and overridden HDL or LDL.

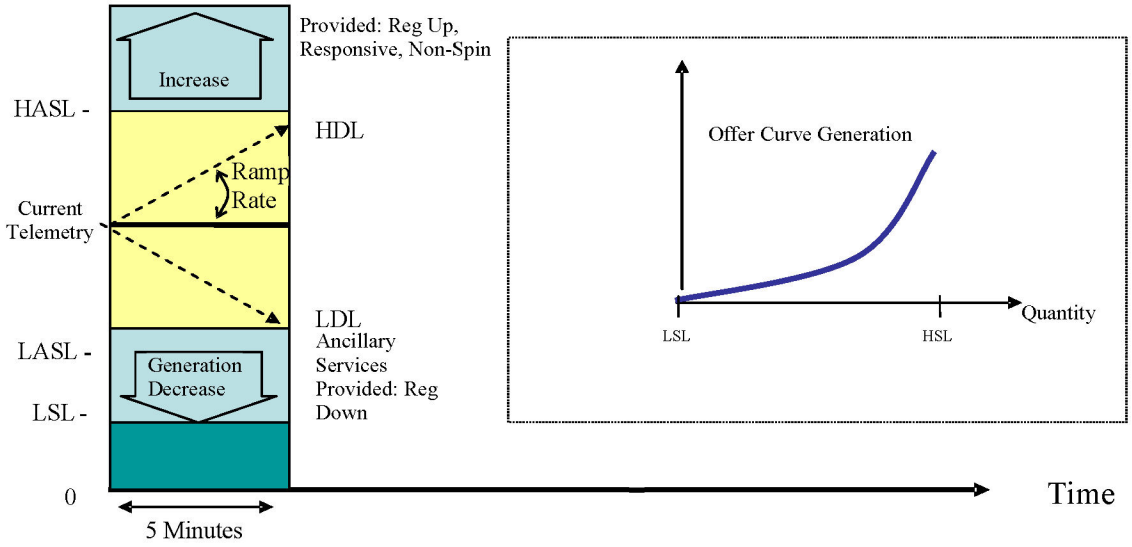
6.5.7.2 Resource Limit Calculator

(1) ERCOT shall calculate the HASL, LASL, SURAMP, SDRAMP, HDL and LDL within four seconds after a change of the Resource-specific attributes provided as part of the QSE's SCADA telemetry under Section 6.5.5.2, Operational Data Requirements. The formulas described below define which Resource-specific attributes must be used to calculate each Resource limit. The Resource limits are used as inputs into both the SCED process and the Ancillary Service Capacity Monitor as described in Section 6.5.7.6, Load Frequency Control. These Resource limits help ensure that the deployments produced by the SCED and Load Frequency Control (LFC) processes will respect the commitment of a Resource to provide Ancillary Services as well as individual Resource physical limitations.

(2) The figures below illustrate how the Resource Limit Calculator determines the Resource limits for Generation and Load Resources:

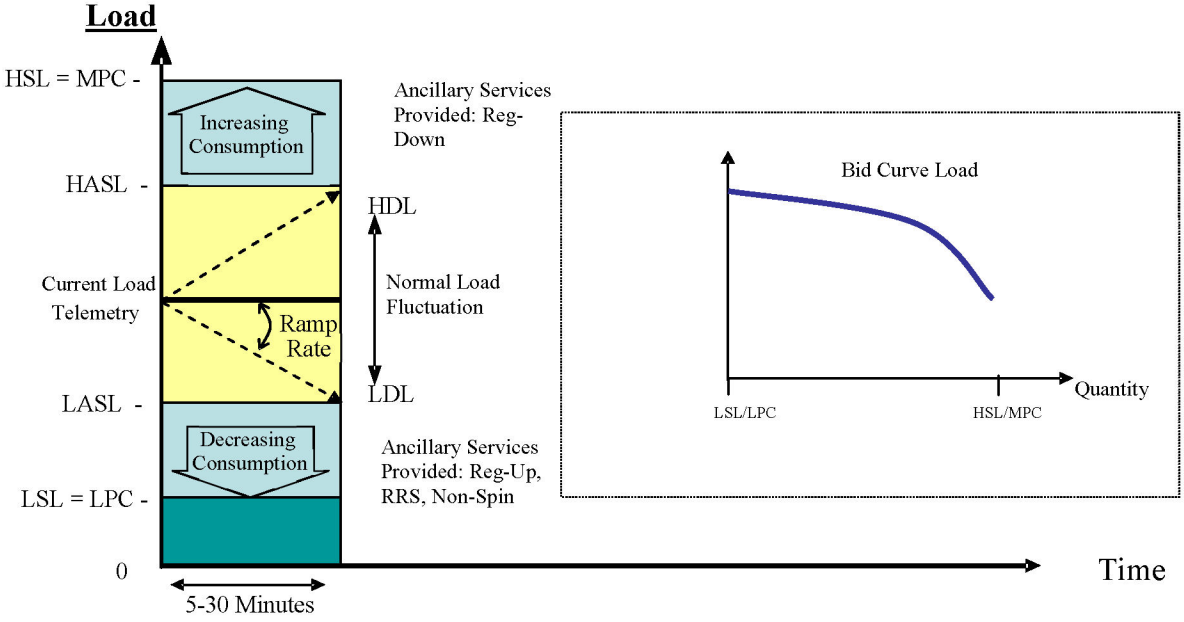
Generation Resources:

Generation



Load Resources:

Load



(3) For Generation Resources, HASL is calculated as follows:

HASL = Max (LASL, (HSLTELEM – (RRSTELEM + RUSTELEM + NSRSTELEM +NFRCTELEM)))

Variable	Description
HASL	High Ancillary Service Limit.
HSLTELEM	High Sustained Limit provided via telemetry – per Section 6.5.5.2.

LASL	Low Ancillary Service Limit.
RRSTELEM	RRS Ancillary Service Schedule provided by telemetry.
RUSTELEM	Reg-Up Ancillary Service Resource Responsibility designation provided by telemetry.
NSRSTELEM	Non-Spin Ancillary Service Schedule provided via telemetry.
NFRCTELEM	NFRC currently available (unloaded) and included in the HSL of the Generation Resource with non-zero RRS Ancillary Service Schedule telemetry.

(4) For Generation Resources, LASL is calculated as follows:

LASL = LSLTELEM + RDSTELEM

Variable	Description
LASL	Low Ancillary Service Limit.
LSLTELEM	Low Sustained Limit provided via telemetry.
RDSTELEM	Reg-Down Ancillary Service Resource Responsibility designation provided by telemetry.

(5) For each Generation Resource, the SURAMP is calculated as follows:

SURAMP = RAMPRATE – (1 – RDSDEPLP) * (RUSTELEM / 7)

Variable	Description
SURAMP	SCED Up Ramp Rate.
RAMPRATE	Normal Ramp Rate up, as telemetered by the QSE, when RRS is not deployed or when the subject Resource is not providing RRS. Emergency Ramp Rate up, as telemetered by the QSE, for Resources deploying RRS.
RUSTELEM	Reg-Up Ancillary Service Resource Responsibility designation provided by telemetry.
RDSDEPLP	Percentage of system-wide Reg-Down Ancillary Resource Responsibility deployed by LFC. This value shall not exceed 100% and controls the amount of ramp rate reserved for Regulation Service in Real-Time.

(6) For each Generation Resource, the SDRAMP is calculated as follows:

SDRAMP = NORMRAMP – (1 – RUSDEPLP) * (RDSTELEM / 7)

Variable	Description
SDRAMP	SCED Down Ramp Rate.
NORMRAMP	Normal Ramp Rate down, as telemetered by the QSE.

Variable	Description
RDSTELEM	Reg-Down Ancillary Service Resource Responsibility designation by Resource provided via telemetry.
RUSDEPLP	Percentage of system-wide Reg-Up Ancillary Resource Responsibility deployed by LFC. This value shall not exceed 100% and controls the amount of ramp rate reserved for Regulation Service in Real-Time.

(7) For Generation Resources, HDL is calculated as follows:

(a) If the telemetered Resource Status is SHUTDOWN, then

HDL = POWERTELEM – (SDRAMP * 5)

(b) If the telemetered Resource Status is any status code specified in item (5)(b)(i) of Section 3.9.1, Current Operating Plan (COP) Criteria, other than SHUTDOWN, then

HDL = Min (POWERTELEM + (SURAMP * 5), HASL)

Variable	Description
HDL	High Dispatch Limit.
POWERTELEM	Gross or net real power provided via telemetry.
SURAMP	SCED Up Ramp Rate.
SDRAMP	SCED Down Ramp Rate.
HASL	High Ancillary Service Limit – definition provided in Section 2, Definitions and Acronyms.

(8) For Generation Resources, LDL is calculated as follows:

(a) If the telemetered Resource Status is STARTUP, then

LDL = POWERTELEM + (SURAMP * 5)

(b) If the telemetered Resource Status is any status code specified in item (5)(b)(i) of Section 3.9.1 other than STARTUP, then

LDL = Max (POWERTELEM - (SDRAMP * 5), LASL)

Variable	Description
LDL	Low Dispatch Limit.
POWERTELEM	Gross or net real power provided via telemetry.
SDRAMP	SCED Down Ramp Rate.
LASL	Low Ancillary Service Limit – definition provided in Section 2.

(9) For Load Resources, HASL is calculated as follows:

HASL = Max (LPCTELEM, (MPCTELEM – RDSTELEM))

Variable	Description
HASL	High Ancillary Service Limit.
LPCTELEM	Low Power Consumption provided via telemetry.
MPCTELEM	Maximum Power Consumption provided via telemetry.
RDSTELEM	Reg-Down Ancillary Service Resource Responsibility designation provided by telemetry.

(10) For Load Resources, LASL is calculated as follows:

LASL = Min (HASL, (LPCTELEM + (RRSTELEM + RUSTELEM + NSRSTELEM)))

Variable	Description
LASL	Low Ancillary Service Limit.
HASL	High Ancillary Service Limit.
LPCTELEM	Low Power Consumption provided via telemetry.
RRSTELEM	RRS Ancillary Service Schedule provided by telemetry.
RUSTELEM	Reg-Up Ancillary Service Resource Responsibility designation provided by telemetry.
NSRSTELEM	Non-Spin Ancillary Service Schedule provided via telemetry.

(11) For each Load Resource, the SURAMP is calculated as follows:

SURAMP = RAMPRATE – (1 – RDSDEPLP) * (RUSTELEM / 7)

Variable	Description
SURAMP	SCED Up Ramp Rate.
RAMPRATE	Normal Ramp Rate up, as telemetered by the QSE, when RRS is not deployed or when the subject Load Resource is not providing RRS. Emergency Ramp Rate up, as telemetered by the QSE, for Load Resources deploying RRS.
RUSTELEM	Reg-Up Ancillary Service Resource Responsibility designation provided by telemetry.
RDSDEPLP	Percentage of system-wide Reg-Down Ancillary Resource Responsibility deployed by LFC. This value shall not exceed 100% and controls the amount of ramp rate reserved for Regulation Service in Real-Time.

(12) For each Load Resource, the SDRAMP is calculated as follows:

SDRAMP = NORMRAMP – (1 – RUSDEPLP) * (RDSTELEM / 7)

Variable	Description
SDRAMP	SCED Down Ramp Rate.
NORMRAMP	Normal Ramp Rate down, as telemetered by the QSE.

Variable	Description
RDSTELEM	Reg-Down Ancillary Service Resource Responsibility designation by Resource provided via telemetry.
RUSDEPLP	Percentage of system-wide Reg-Up Ancillary Resource Responsibility deployed by LFC. This value shall not exceed 100% and controls the amount of ramp rate reserved for Regulation Service in Real-Time.

(13) For Load Resources, HDL is calculated as follows:

HDL = Min (POWERTELEM + (SDRAMP * 5), HASL)

Variable	Description
HDL	High Dispatch Limit.
POWERTELEM	Net real power flow provided via telemetry.
SDRAMP	SCED Down Ramp Rate.
HASL	High Ancillary Service Limit – definition provided in Section 2.

(14) For Load Resources, LDL is calculated as follows:

LDL = Max (POWERTELEM - (SURAMP * 5), LASL)

Variable	Description
LDL	Low Dispatch Limit.
POWERTELEM	Net real power flow provided via telemetry.
SURAMP	SCED Up Ramp Rate.
LASL	Low Ancillary Service Limit – definition provided in Section 2.

[NPRR863, NPRR879, NPRR1010, and NPRR1014: Replace applicable portions of Section 6.5.7.2 above with the following upon system implementation for NPRR863, NPRR879, or NPRR1014; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.2 Resource Limit Calculator

(1) ERCOT shall calculate the HDL and LDL within four seconds after a change of the Resource-specific attributes provided as part of the QSE's SCADA telemetry under Section 6.5.5.2, Operational Data Requirements. The formulas described below define which Resource-specific attributes must be used to calculate each Resource limit. The Resource limits are used as inputs into both the SCED process and the Ancillary Service Capacity Monitor as described in Section 6.5.7.6, Load Frequency Control. These Resource limits help ensure that the deployments produced by the SCED and Load Frequency Control (LFC) processes will respect individual Resource physical limitations.

(2) For SCED-dispatchable Generation Resources, HDL is calculated as follows:

(a) If the telemetered Resource Status is SHUTDOWN, then

HDL = POWERTELEM – (NORMRAMPDN * 5)

(b) If the telemetered Resource Status is any status code specified in item (5)(b)(i) of Section 3.9.1, Current Operating Plan (COP) Criteria, other than SHUTDOWN, then

HDL = Min (POWERTELEM + (NORMRAMPUP * 5), HSLTELEM)

Variable	Description
HDL	High Dispatch Limit.
POWERTELEM	Gross or net real power provided via telemetry.
NORMRAMPDN	5-minute blended Normal Ramp Rate down, as telemetered by the QSE.
NORMRAMPUP	5-minute blended Normal Ramp Rate up, as telemetered by the QSE.
HSLTELEM	For IRRs qualified to provide an Ancillary Service and telemetering a non-zero capability to provide that Ancillary Service, and all IRRs within an IRR Group where any IRR within the IRR Group is qualified to provide an Ancillary Service and telemetering a non-zero capability to provide that Ancillary Service, HSLTELEM shall be the five-minute intra-hour forecast for the Resource. For all other Resources, HSLTELEM shall be the Resource's HSL provided to ERCOT via telemetry, in accordance with Section 6.5.5.2.

(3) For SCED-dispatchable Generation Resources, LDL is calculated as follows:

(a) If the telemetered Resource Status is STARTUP, then

LDL = POWERTELEM + (NORMRAMPUP * 5)

(b) If the telemetered Resource Status is any status code specified in item (5)(b)(i) of Section 3.9.1 other than STARTUP, then

LDL = Max (POWERTELEM - (NORMRAMPDN * 5), LSLTELEM)

Variable	Description
LDL	Low Dispatch Limit.
POWERTELEM	Gross or net real power provided via telemetry.
LSLTELEM	Low Sustained Limit (LSL) provided via telemetry.
NORMRAMPDN	5-minute blended Normal Ramp Rate down, as telemetered by the QSE.
NORMRAMPUP	5-minute blended Normal Ramp Rate up, as telemetered by the QSE.

(4) For ESRs, HDL is calculated as follows:

(a) If the telemetered Resource Status is ONHOLD, then

HDL = 0

(b) If the telemetered Resource Status is ONTEST, then

HDL = Max (Min (POWERTELEM, HSLTELEM), LSLTELEM)

(c) If the telemetered Resource Status is any status code specified in item (5)(b)(iv) of Section 3.9.1, Current Operating Plan (COP) Criteria, other than OUT, EMR, EMRSWGR, ONHOLD, or ONTEST, then

HDL = Min (POWERTELEM + (NORMRAMPUP* 5), HSLTELEM)

Variable	Description
HDL	High Dispatch Limit.
POWERTELEM	Net real power provided via telemetry.
NORMRAMPUP	5-minute blended Normal Ramp Rate up, as telemetered by the QSE.
HSLTELEM	High Sustained Limit (HSL) provided via telemetry – per Section 6.5.5.2.

(5) For ESRs, LDL is calculated as follows:

(a) If the telemetered Resource Status is ONHOLD, then

LDL = 0

(b) If the telemetered Resource Status is ONTEST, then

LDL = Max (Min (POWERTELEM, HSLTELEM), LSLTELEM)

(c) If the telemetered Resource Status is any status code specified in item (5)(b)(iv) of Section 3.9.1, Current Operating Plan (COP) Criteria, other than OUT, or EMR, or EMRSWGR, or ONHOLD, or ONTEST, then

LDL = Max (POWERTELEM - (NORMRAMPDN * 5), LSLTELEM)

Variable	Description
LDL	Low Dispatch Limit.
POWERTELEM	Net real power provided via telemetry.
LSLTELEM	Low Sustained Limit provided via telemetry.
NORMRAMPDN	5-minute blended Normal Ramp Rate down, as telemetered by the QSE.

(6) For SCED-dispatchable Load Resources, HDL is calculated as follows:

HDL = Min (POWERTELEM + (NORMRAMPDN * 5), HSLTELEM)

Variable	Description
HDL	High Dispatch Limit.
POWERTELEM	Net real power flow provided via telemetry.
NORMRAMPDN	Normal Ramp Rate down, as telemetered by the QSE.
HSLTELEM	HSL provided via telemetry.

(7) For SCED-dispatchable Load Resources, LDL is calculated as follows:

LDL = Max (POWERTELEM - (NORMRAMPUP * 5), LSLTELEM)

Variable	Description
LDL	Low Dispatch Limit.
POWERTELEM	Net real power flow provided via telemetry.
NORMRAMPUP	Normal Ramp Rate up, as telemetered by the QSE.
LSLTELEM	LSL provided via telemetry.

6.5.7.3 Security Constrained Economic Dispatch

(1) The SCED process is designed to simultaneously manage energy, the system power balance and network congestion through Resource Base Points and calculation of LMPs every five minutes. The SCED process uses a two-step methodology that applies mitigation prospectively to resolve Non-Competitive Constraints for the current Operating Hour. The SCED process evaluates Energy Offer Curves, Output Schedules and Real-Time Market (RTM) Energy Bids to determine Resource Dispatch Instructions by maximizing bid-based revenues minus offer-based costs, subject to power balance and network constraints. The SCED process uses the Resource Status provided by SCADA telemetry under Section 6.5.5.2, Operational Data Requirements, and validated by the Real-Time Sequence, instead of the Resource Status provided by the COP.

(2) The SCED solution must monitor cumulative deployment of Regulation Services and ensure that Regulation Services deployment is minimized over time.

(3) In the Generation To Be Dispatched (GTBD) determined by LFC, ERCOT shall subtract the sum of the telemetered net real power consumption from all Controllable Load Resources available to SCED.

(4) For use as SCED inputs, ERCOT shall use the available capacity of all committed Generation Resources by creating proxy Energy Offer Curves for certain Resources as follows:

(a) Non-IRRs and Dynamically Scheduled Resources (DSRs) without Energy Offer Curves

(i) ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below for:

(A) Each non-IRR for which its QSE has submitted an Output Schedule instead of an Energy Offer Curve; and

(B) Each DSR that has not submitted incremental and decremental Energy Offer Curves.

MW	Price (per MWh)
HSL	SWCAP
Output Schedule MW plus 1 MW	SWCAP minus $0.01
Output Schedule MW	-$249.99
LSL	-$250.00

(b) DSRs with Energy Offer Curves

(i) For each DSR that has submitted incremental and decremental Energy Offer Curves, ERCOT shall create a monotonically increasing proxy Energy Offer Curve. That curve must consist of the incremental Energy Offer Curve that reflects the available capacity above the Resource's Output Schedule to its HSL and the decremental Energy Offer Curve that reflects the available capacity below the Resource's Output Schedule to the LSL. The curve must be created as described below:

MW	Price (per MWh)
Output Schedule MW plus 1 MW to HSL	Incremental Energy Offer Curve
LSL to Output Schedule MW	Decremental Energy Offer Curve

(c) Non-IRRs without full-range Energy Offer Curves

(i) For each non-IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the Resource's available capacity, ERCOT shall create a proxy Energy Offer Curve that extends the submitted Energy Offer Curve to use the entire available capacity of the Resource above the highest point on the Energy Offer Curve to the Resource's HSL and the offer floor from the lowest point on the Energy Offer Curve to its LSL, using these points:

MW	Price (per MWh)
HSL (if more than highest MW in submitted Energy Offer Curve)	Price associated with highest MW in submitted Energy Offer Curve
Energy Offer Curve	Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(d) IRRs

(i) For each IRR that has not submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL	$1,500
HSL minus 1 MW	-$249.99
LSL	-$250.00

(ii) For each IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the IRR's available capacity, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL (if more than highest MW in submitted Energy Offer Curve)	Price associated with the highest MW in submitted Energy Offer Curve
Energy Offer Curve	Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(e) RUC-committed Resources

(i) For each RUC-committed Resource that has not submitted an Energy Offer Curve, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL	$250
Zero	$250

(ii) For each RUC-committed Resource that has submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL (if more than highest MW in Energy Offer Curve)	Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve

Energy Offer Curve	Greater of $250 or the QSE submitted Energy Offer Curve
Zero	Greater of $250 or the first price point of the QSE submitted Energy Offer Curve

(iii) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has not submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	**Price (per MWh)**
HSL of RUC-committed configuration	$250
Zero	$250

(iv) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	**Price (per MWh)**
HSL of RUC-committed configuration (if more than highest MW in Energy Offer Curve)	Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve
Energy Offer Curve for MW at and above HSL of QSE-committed configuration	Greater of $250 or the QSE submitted Energy Offer Curve
HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve and price associated with highest MW in Energy Offer Curve is less than $250)	$250
HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve)	Price associated with the highest MW in QSE submitted Energy Offer Curve
Energy Offer Curve for MW at and below HSL of QSE-committed configuration	The QSE submitted Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(5) The Entity with decision making authority, as more fully described in Section 3.19.1, Constraint Competitiveness Test Definitions, over how a Resource or Split Generation Resource is offered or scheduled, shall be responsible for all offers associated with each Resource, including offers represented by a proxy Energy Offer Curve.

(6) For a Controllable Load Resource whose QSE has submitted an RTM Energy Bid that does not cover the full range of the Resource's available Demand response capability, consistent with the Controllable Load Resource's telemetered quantities, ERCOT shall create a proxy energy bid as described below:

MW	**Price (per MWh)**
LPC to MPC minus maximum MW of RTM Energy Bid	Price associated with the lowest MW in submitted RTM Energy Bid curve
MPC minus maximum MW of RTM Energy Bid to MPC	RTM Energy Bid curve
MPC	Right-most point (lowest price) on RTM Energy Bid curve

(7) ERCOT shall ensure that any RTM Energy Bid is monotonically non-increasing. The QSE representing the Controllable Load Resource shall be responsible for all RTM Energy Bids, including bids updated by ERCOT as described above.

(8) If a Controllable Load Resource telemeters a status of OUTL, it is not considered as dispatchable capacity by SCED. A QSE may use this function to inform ERCOT of instances when the Controllable Load Resource is unable to follow SCED Dispatch Instructions. Under all telemetered statuses including OUTL, the remaining telemetry quantities submitted by the QSE shall represent the operating conditions of the Controllable Load Resource that can be verified by ERCOT. A QSE representing a Controllable Load Resource with a telemetered status of OUTL is still obligated to provide any applicable Ancillary Service Resource Responsibilities previously awarded to that Controllable Load Resource. This paragraph does not apply to ESRs.

(9) Energy Offer Curves that were constructed in whole or in part with proxy Energy Offer Curves shall be so marked in all ERCOT postings or references to the energy offer.

(10) The two-step SCED methodology referenced in paragraph (1) above is:

(a) The first step is to execute the SCED process to determine Reference LMPs. In this step, ERCOT executes SCED using the full Network Operations Model while only observing limits of Competitive Constraints. Energy Offer Curves for all On-Line Generation Resources and RTM Energy Bids from available Controllable Load Resources, whether submitted by QSEs or created by ERCOT under this Section, are used in the SCED to determine "Reference LMPs."

(b) The second step is to execute the SCED process to produce Base Points, Shadow Prices, and LMPs, subject to security constraints (including Competitive and Non-Competitive Constraints) and other Resource constraints. The second step must:

(i) Use Energy Offer Curves for all On-Line Generation Resources, whether submitted by QSEs or created by ERCOT. Each Energy Offer Curve must be bounded at the lesser of the Reference LMP (from Step 1) or the appropriate Mitigated Offer Floor. In addition, each Energy Offer Curve subject to mitigation under the criteria described in Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, must be capped at the greater of the Reference LMP (from Step 1) at the Resource Node plus a variable not to exceed 0.01 multiplied by the value of the Resource's Mitigated Offer Cap (MOC) curve at the LSL or the appropriate MOC;

(ii) Use RTM Energy Bid curves for all available Controllable Load Resources, whether submitted by QSEs or created by ERCOT. There is no mitigation of RTM Energy Bids. An RTM Energy Bid from a Controllable Load Resource represents the bid for energy distributed across all nodes in the Load Zone in which the Controllable Load Resource is located. For an ESR, an RTM Energy Bid represents a bid for energy at the ESR's Resource Node; and

(iii) Observe all Competitive and Non-Competitive Constraints.

(c) ERCOT shall archive information and provide monthly summaries of security violations and any binding transmission constraints identified in Step 2 of the SCED process. The summary must describe the limiting element (or identified operator-entered constraint with operator's comments describing the reason and the Resource-specific impacts for any manual overrides). ERCOT shall provide the summary to Market Participants on the MIS Secure Area and to the Independent Market Monitor (IMM).

(11) For each SCED process, in addition to the binding Base Points and LMPs, ERCOT shall calculate a non-binding projection of the Base Points and Resource Node LMPs, Real-Time Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders, Hub LMPs and Load Zone LMPs at a frequency of every five minutes for at least 15 minutes into the future based on the same inputs to the SCED process as described in this Section, except that the Resource's HDL and LDL and the total generation requirement will be as estimated at future intervals. The Resource's HDL and LDL will be calculated for each interval of the projection based on the ramp rate capability over the study period. ERCOT shall estimate the projected total generation requirement by calculating a Load forecast for the study period. In lieu of the steps described in Section 6.5.7.3.1, Determination of Real-Time On-Line Reliability Deployment Price Adder, the non-binding projection of Real-Time Reliability Deployment Price Adders shall be estimated based on GTBD, reliability deployments MWs, and aggregated offers. The Energy Offer Curve from SCED Step 2, the virtual offers for Load Resources deployed and the power balance penalty curve will be compared against the updated GTBD to get an estimate of the System Lambda from paragraph (2)(m) of Section 6.5.7.3.1. ERCOT shall post the projected non-binding Base Points for each Resource for each interval study period on the MIS Certified Area and the

projected non-binding LMPs for Resource Nodes, Real-Time Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders, Hub LMPs and Load Zone LMPs on the ERCOT website pursuant to Section 6.3.2, Activities for Real-Time Operations.

(12) For each SCED process, ERCOT shall calculate a Real-Time On-Line Reserve Price Adder and a Real-Time Off-Line Reserve Price Adder based on the On-Line and Off-Line available reserves in the ERCOT System and the Operating Reserve Demand Curve (ORDC). The Real-Time Off-Line available reserves shall be administratively set to zero when the SCED snapshot of the Physical Responsive Capability (PRC) is equal to or below the PRC MW at which Energy Emergency Alert (EEA) Level 1 is initiated. In addition, for each SCED process, ERCOT shall calculate a Real-Time On-Line Reliability Deployment Price Adder. The sum of the Real-Time Reliability Deployment Price Adder and the Real-Time On-Line Reserve Price Adder shall be averaged over the 15-minute Settlement Interval and added to the Real-Time LMPs to determine the Real-Time Settlement Point Prices. The price after the addition of the sum of the Real-Time On-Line Reliability Deployment Price Adder and the Real-Time On-Line Reserve Price Adder to LMPs approximates the pricing outcome of the impact to energy prices from reliability deployments and the Real-Time energy and Ancillary Service co-optimization since the Real-Time On-Line Reserve Price Adder captures the value of the opportunity cost of reserves based on the defined ORDC. An Ancillary Service imbalance Settlement shall be performed pursuant to Section 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge, to make Resources indifferent to the utilization of their capacity for energy or Ancillary Service reserves.

(13) ERCOT shall determine the methodology for implementing the ORDC to calculate the Real-Time On-Line Reserve Price Adder and Real-Time Off-Line Reserve Price Adder. Following review by TAC, the ERCOT Board shall review the recommendation and approve a final methodology. Within two Business Days following approval by the ERCOT Board, ERCOT shall post the methodology on the ERCOT website.

(14) At the end of each season, ERCOT shall determine the ORDC for the same season in the upcoming year, based on historic data using the ERCOT Board-approved methodology for implementing the ORDC. Annually, ERCOT shall verify that the ORDC is adequately representative of the loss of Load probability for varying levels of reserves. Twenty days after the end of the Season, ERCOT shall post the ORDC for the same season of the upcoming year on the ERCOT website.

(15) ERCOT may override one or more of a Controllable Load Resource's parameters in SCED if ERCOT determines that the Controllable Load Resource's participation is having an adverse impact on the reliability of the ERCOT System.

(16) The QSE representing an ESR, in order to charge the ESR, must submit RTM Energy Bids, and the ESR may withdraw energy from the ERCOT System only when dispatched by SCED to do so. An ESR may telemeter a status of OUTL only if the ESR is in Outage status.

[NPRR930, NPRR1000, NPRR1010, NPRR1014, and NPRR1019: Replace applicable portions of Section 6.5.7.3 above with the following upon system implementation for NPRR930, NPRR1000, NPRR1014, or NPRR1019; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.3 Security Constrained Economic Dispatch

(1) The SCED process is designed to simultaneously manage energy, Ancillary Services, the system power balance and network congestion through Resource Base Points, Ancillary Service awards, and the calculation of LMPs and Real-Time MCPCs approximately every five minutes, or more frequently if necessary. The SCED process uses a two-step methodology that applies mitigation to offers for energy prospectively to resolve Non-Competitive Constraints for the current Operating Hour. The SCED process evaluates Energy Offer Curves, Energy Bid/Offer Curves, Ancillary Service Offers, Output Schedules and Real-Time Market (RTM) Energy Bids to determine Resource Dispatch Instructions and Ancillary Service awards by maximizing bid-based revenues minus offer-based costs, subject to power balance, Ancillary Service Demand Curves (ASDCs), and network constraints. The SCED process uses the Resource Status provided by SCADA telemetry under Section 6.5.5.2, Operational Data Requirements, and validated by the Real-Time Sequence, instead of the Resource Status provided by the COP.

(2) The SCED solution must monitor cumulative deployment of Regulation Services and ensure that Regulation Services deployment is minimized over time.

(3) In the Generation To Be Dispatched (GTBD) determined by LFC, ERCOT shall subtract the sum of the telemetered net real power consumption from all Controllable Load Resources available to SCED.

(4) For use as SCED inputs for determining energy dispatch and Ancillary Service awards, ERCOT shall use the available capacity of all committed Generation Resources by creating proxy Energy Offer Curves for certain Resources as follows:

(a) Non-IRRs without Energy Offer Curves

(i) ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below for:

(A) Each non-IRR for which its QSE has submitted an Output Schedule instead of an Energy Offer Curve.

MW	Price (per MWh)
HSL	RTSWCAP
Output Schedule MW plus 1 MW	RTSWCAP minus $0.01
Output Schedule MW	-$249.99
LSL	-$250.00

(b) Non-IRRs without full-range Energy Offer Curves

(i) For each non-IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the Resource's available capacity, ERCOT shall create a proxy Energy Offer Curve that extends the submitted Energy Offer Curve to use the entire available capacity of the Resource above the highest point on the Energy Offer Curve to the Resource's HSL and the offer floor from the lowest point on the Energy Offer Curve to its LSL, using these points:

MW	**Price (per MWh)**
HSL (if more than highest MW in submitted Energy Offer Curve)	Price associated with highest MW in submitted Energy Offer Curve
Energy Offer Curve	Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(c) IRRs

(i) For each IRR that has not submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	**Price (per MWh)**
HSL	$1,500
HSL minus 1 MW	-$249.99
LSL	-$250.00

(ii) For each IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the IRR's available capacity, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	**Price (per MWh)**
HSL (if more than highest MW in submitted Energy Offer Curve)	Price associated with the highest MW in submitted Energy Offer Curve
Energy Offer Curve	Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(d) RUC-committed Resources

(i) For each RUC-committed Resource that has not submitted an Energy Offer Curve, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL	$250
Zero	$250

(ii) For each RUC-committed Resource that has submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL (if more than highest MW in Energy Offer Curve)	Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve
Energy Offer Curve	Greater of $250 or the QSE submitted Energy Offer Curve
Zero	Greater of $250 or the first price point of the QSE submitted Energy Offer Curve

(iii) For each RUC-committed Resource during the time period stated in the Advance Action Notice (AAN) if any Resource received an Outage Schedule Adjustment, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL	$4,500 or the effective Value of Lost Load (VOLL), whichever is less.
Zero	$4,500 or the effective VOLL, whichever is less.

(iv) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has not submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL of RUC-committed configuration	$250
Zero	$250

(v) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL of RUC-committed configuration (if more than highest MW in Energy Offer Curve)	Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve
Energy Offer Curve for MW at and above HSL of QSE-committed configuration	Greater of $250 or the QSE submitted Energy Offer Curve
HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve and price associated with highest MW in Energy Offer Curve is less than $250)	$250
HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve)	Price associated with the highest MW in QSE submitted Energy Offer Curve
Energy Offer Curve for MW at and below HSL of QSE-committed configuration	The QSE submitted Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(vi) For each RUC-committed Switchable Generation Resource (SWGR) that is not part of a Combined Cycle Train already operating in ERCOT, that has not submitted an Energy Offer Curve, and that has a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of the RUC instruction, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL	$4,500 or the effective Value of Lost Load (VOLL), whichever is less

Zero	$4,500 or the effective VOLL, whichever is less

(vii) For each RUC-committed SWGR that is not part of a Combined Cycle Train already operating in ERCOT, that has submitted an Energy Offer Curve, and that has a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of the RUC instruction, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL (if more than highest MW in Energy Offer Curve)	Greater of: $4,500 or the effective VOLL, whichever is less; and the price associated with the highest MW in QSE-submitted Energy Offer Curve
Energy Offer Curve	Greater of: $4,500 or the effective VOLL, whichever is less; and the QSE-submitted Energy Offer Curve
Zero	Greater of: $4,500 or the effective VOLL, whichever is less; and the first price point of the QSE-submitted Energy Offer Curve

(viii) For each Combined Cycle Train configuration that includes at least one SWGR that is operating in a non-ERCOT Control Area as part of a configuration with a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of a RUC instruction requiring the switching of the SWGR into the ERCOT Control Area, if the QSE for the Combined Cycle Train has not submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL of RUC-committed configuration	$4,500 or the effective VOLL, whichever is less
Zero	$4,500 or the effective VOLL, whichever is less

(ix) For each Combined Cycle Train configuration that includes at least one SWGR that is operating in a non-ERCOT Control Area as part of a configuration with a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of a RUC instruction requiring the switching of the SWGR into the ERCOT Control Area, if the QSE for the Combined Cycle Train has submitted an Energy Offer Curve for the

RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

MW	Price (per MWh)
HSL of RUC-committed configuration (if more than highest MW in Energy Offer Curve)	Greater of: $4,500 or the effective VOLL, whichever is less; and the price associated with the highest MW in QSE-submitted Energy Offer Curve
Energy Offer Curve for MW at and above HSL of QSE-committed configuration	Greater of: $4,500 or the effective VOLL, whichever is less; and the QSE-submitted Energy Offer Curve
HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve and price associated with highest MW in Energy Offer Curve is less than $4,500)	$4,500 or the effective VOLL, whichever is less
HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve)	Price associated with the highest MW in QSE-submitted Energy Offer Curve
Energy Offer Curve for MW at and below HSL of QSE-committed configuration	The QSE-submitted Energy Offer Curve
1 MW below lowest MW in Energy Offer Curve (if more than LSL)	-$249.99
LSL (if less than lowest MW in Energy Offer Curve)	-$250.00

(5) For use as SCED inputs for determining energy dispatch and Ancillary Service awards, ERCOT shall use the available Ancillary Service MW capacity of all Resources by creating a proxy Ancillary Service Offer for qualified Resources as follows:

(a) The proxy Ancillary Service Offer shall be a linked Ancillary Service Offer across all Ancillary Service products for which a Resource is qualified to provide. For Generation Resources, the proxy Ancillary Service Offer MW shall be equal to the Resource's telemetered HSL. For ESRs, the proxy Ancillary Service Offer MW shall be equal to the difference between the Resource's telemetered HSL and LSL. For Load Resources, the proxy Ancillary Service Offer MW shall be equal to the Resource's telemetered Maximum Power Consumption (MPC).

(b) For Resources that are not RUC-committed, the price in the proxy Ancillary Service Offer shall be set to:

(i) For Reg-Up and RRS, the maximum of:

(A) The proxy Ancillary Service Offer price floor for Reg-Up or RRS, respectively;

(B) The Resource's highest submitted Ancillary Service Offer price for Reg-Up or RRS, respectively;

(C) The Resource's highest Ancillary Service Offer price for ECRS (submitted or proxy); or

(D) The Resource's highest Ancillary Service Offer price for Non-Spin (submitted or proxy).

(ii) For ECRS, the maximum of:

(A) The proxy Ancillary Service Offer price floor for ECRS;

(B) The Resource's highest submitted Ancillary Service Offer price for ECRS; or

(C) The Resource's highest Ancillary Service Offer price for Non-Spin (submitted or proxy).

(iii) For Non-Spin, the maximum of:

(A) The proxy Ancillary Service Offer price floor for Non-Spin; or

(B) The Resource's highest submitted Ancillary Service Offer price for Non-Spin.

(iv) For Reg-Down, the maximum of:

(A) The proxy Ancillary Service Offer price floor for Reg-Down; or

(B) The Resource's highest submitted Ancillary Service Offer price for Reg-Down.

(c) ERCOT systems shall be designed to allow for proxy Ancillary Service Offer price floors to differ when the same Ancillary Service product can be provided by either On-Line or Off-Line Resources, and/or an Ancillary Service product has sub-types.

(d) Proxy Ancillary Service Offer price floors shall be approved by TAC and posted on the ERCOT website.

(e) For RUC-committed Resources:

(i) If a RUC-committed Resource does not have an Ancillary Service Offer for an Ancillary Service product that the Resource is qualified to

provide, ERCOT shall create an Ancillary Service Offer for that Ancillary Service product at a value of $250/MWh for the full operating range of the Resource up to its telemetered HSL.

(ii) For each Ancillary Service product for which a RUC-committed Resource has an Ancillary Service Offer, the Ancillary Service Offer used by SCED for that Ancillary Service product across the full operating range of the Resource up to its telemetered HSL shall be the maximum of:

(A) The Resource's highest submitted Ancillary Service Offer price; or

(B) $250/MWh.

(6) For use as SCED inputs for determining energy Dispatch and Ancillary Service awards, ERCOT shall use the available capacity of all On-Line ESRs by creating proxy Energy Bid/Offer Curves for certain Resources as follows:

(a) For each ESR for which its QSE has submitted an Energy Bid/Offer Curve that does not cover the full offer range (LSL to HSL) of the Resource's available capacity, ERCOT shall create a proxy Energy Bid/Offer Curve that extends the submitted Energy Bid/Offer Curve to use the entire available capacity of the Resource above the highest MW point on the Energy Bid/Offer Curve to the Resource's HSL and from the lowest MW point on the Energy Bid/Offer Curve to LSL, using these prices for the corresponding MW segments:

Scenario	MW Segment	Price (per MWh)
HSL MW and the highest MW point on the Energy Bid/Offer are both greater than or equal to zero, and, HSL is greater than the highest MW in submitted Energy Bid/Offer Curve	From highest MW point on submitted Energy Bid/Offer Curve to HSL MW	RTSWCAP
HSL MW is greater than or equal to zero, and, the highest MW point on the Energy Bid/Offer is less than zero	From highest MW point on submitted Energy Bid/Offer Curve to 0 MW From 0 MW to HSL	Price associated with the highest MW in submitted Energy Bid/Offer Curve RTSWCAP
HSL is less than zero and is also greater than the highest MW in submitted Energy Bid/Offer Curve	From highest MW point on submitted Energy Bid/Offer Curve to HSL MW	Price associated with the highest MW in submitted Energy Bid/Offer Curve
Energy Bid/Offer Curve		Energy Bid/Offer Curve
LSL MW and the lowest MW point on the Energy Bid/Offer Curve are both greater than or equal to zero,	From LSL to lowest MW point on submitted Energy Bid/Offer Curve	Price associated with the lowest MW in submitted Energy Bid/Offer Curve

and, LSL is less than the lowest MW in submitted Energy Bid/Offer Curve		
LSL MW is less than zero, and, the lowest MW point on the Energy Bid/Offer Curve is greater than zero	From LSL to 0 MW From 0 MW to lowest MW point on submitted Energy Bid/Offer Curve	-$250.00 Price associated with the lowest MW in submitted Energy Bid/Offer Curve
LSL and the lowest MW point on the Energy Bid/Offer Curve are both less than or equal to zero, and, LSL is less than the lowest MW point on the Energy Bid/Offer Curve	From LSL to lowest MW point on submitted Energy Bid/Offer Curve	-$250.00

(b) At the time of SCED execution, if a valid Energy Bid/Offer Curve or Output Schedule does not exist for an ESR that has a status of On-Line, then ERCOT shall notify the QSE and create a proxy Energy Bid/Offer Curve priced at -$250/MWh for the MW portion of the curve less than zero MW, and priced at the RTSWCAP for the MW portion of the curve greater than zero MW.

(c) At the time of SCED execution, if a QSE representing an ESR has submitted an Output Schedule instead of an Energy Bid/Offer Curve, ERCOT shall create a proxy Energy Bid/Offer Curve priced at -$250/MWh for the MW portion of the curve from its LSL to the MW amount on the Output Schedule, and priced at the RTSWCAP for the MW portion of the curve from the MW amount on the Output Schedule to its HSL.

(7) The Entity with decision-making authority, as more fully described in Section 3.19.1, Constraint Competitiveness Test Definitions, over how a Resource or Split Generation Resource is offered or scheduled, shall be responsible for all offers associated with each Resource, including offers represented by a proxy Energy Offer Curve, proxy Energy Bid/Offer Curve, or proxy Ancillary Service Offer.

(8) For a Controllable Load Resource whose QSE has submitted an RTM Energy Bid that does not cover the full range of the Resource's available Demand response capability, consistent with the Controllable Load Resource's telemetered quantities, ERCOT shall create a proxy energy bid as described below:

MW	**Price (per MWh)**
LPC to MPC minus maximum MW of RTM Energy Bid	Price associated with the lowest MW in submitted RTM Energy Bid curve
MPC minus maximum MW of RTM Energy Bid to MPC	RTM Energy Bid curve

MPC	Right-most point (lowest price) on RTM Energy Bid curve

(9) ERCOT shall ensure that any RTM Energy Bid is monotonically non-increasing. The QSE representing the Controllable Load Resource shall be responsible for all RTM Energy Bids, including bids updated by ERCOT as described above.

(10) If a Controllable Load Resource telemeters a status of OUTL, it is not considered as dispatchable capacity by SCED. A QSE may use this function to inform ERCOT of instances when the Controllable Load Resource is unable to follow SCED Dispatch Instructions. Under all telemetered statuses including OUTL, the remaining telemetry quantities submitted by the QSE shall represent the operating conditions of the Controllable Load Resource that can be verified by ERCOT. A QSE representing a Controllable Load Resource with a telemetered status of OUTL is still obligated to provide any applicable Ancillary Services awarded to the Resource. This paragraph does not apply to ESRs.

(11) Energy Offer Curves that were constructed in whole or in part with proxy Energy Offer Curves shall be so marked in all ERCOT postings or references to the energy offer.

(12) SCED will enforce Resource-specific Ancillary Service constraints to ensure that Ancillary Service awards are aligned with a Resource's qualifications and telemetered Ancillary Service capabilities.

(13) Energy Bid/Offer Curves that were constructed in whole or in part with proxy Energy Bid/Offer Curves shall be so marked in all ERCOT postings or references to the energy bid/offer.

(14) The two-step SCED methodology referenced in paragraph (1) above is:

(a) The first step is to execute the SCED process to determine Reference LMPs. In this step, ERCOT executes SCED using the full Network Operations Model while only observing limits of Competitive Constraints in addition to power balance and Ancillary Service constraints. Energy Offer Curves for all On-Line Generation Resources, Energy Bid/Offer Curves for all On-Line ESRs, and RTM Energy Bids from available Controllable Load Resources, whether submitted by QSEs or created by ERCOT under this Section, are used in the SCED to determine "Reference LMPs."

(b) The second step is to execute the SCED process to produce Base Points, Ancillary Service awards, Shadow Prices, Real-Time MCPCs, and LMPs, subject to security constraints (including Competitive and Non-Competitive Constraints) and other Resource constraints. The second step must:

(i) Use Energy Offer Curves for all On-Line Generation Resources, whether submitted by QSEs or created by ERCOT. Each Energy Offer Curve must be bounded at the lesser of the Reference LMP (from Step

1) or the appropriate Mitigated Offer Floor. In addition, each Energy Offer Curve subject to mitigation under the criteria described in Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, must be capped at the greater of the Reference LMP (from Step 1) at the Resource Node plus a variable not to exceed 0.01 multiplied by the value of the Resource's Mitigated Offer Cap (MOC) curve at the LSL or the appropriate MOC;

(ii) Use Energy Bid/Offer Curves for all On-Line ESRs, whether submitted by QSEs or created by ERCOT. Each Energy Bid/Offer Curve must be bounded at the lesser of the Reference LMP (from Step 1) or the appropriate Mitigated Offer Floor. The offer portion of each Energy Bid/Offer Curve subject to mitigation under the criteria described in Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, must be capped at the greater of the Reference LMP (from Step 1) at the Resource Node plus a variable not to exceed 0.01 multiplied by the value of the Resource's MOC curve at the LSL or the appropriate MOC;

(iii) Use RTM Energy Bid curves for all available Controllable Load Resources, whether submitted by QSEs or created by ERCOT. There is no mitigation of RTM Energy Bids. An RTM Energy Bid from a Controllable Load Resource represents the bid for energy distributed across all nodes in the Load Zone in which the Controllable Load Resource is located. For an ESR, an RTM Energy Bid represents a bid for energy at the ESR's Resource Node;

(iv) Observe all Competitive and Non-Competitive Constraints; and

(v) Use Ancillary Service Offers to determine Ancillary Service awards.

(c) ERCOT shall archive information and provide monthly summaries of security violations and any binding transmission constraints identified in Step 2 of the SCED process. The summary must describe the limiting element (or identified operator-entered constraint with operator's comments describing the reason and the Resource-specific impacts for any manual overrides). ERCOT shall provide the summary to Market Participants on the MIS Secure Area and to the Independent Market Monitor (IMM).

(d) The System Lambda used to determine LMPs from SCED Step 2 shall be capped at the effective VOLL.

(15) For each SCED process, in addition to the binding Base Points, Ancillary Service awards, Real-Time MCPCs, and LMPs, ERCOT shall calculate a non-binding projection of the Base Points, Ancillary Service awards, MCPCs, Resource Node LMPs, Real-Time Reliability Deployment Price Adders, Hub LMPs, and Load Zone LMPs at a frequency of every five minutes for at least 15 minutes into the future based

on the same inputs to the SCED process as described in this Section, except that the Resource's HDL and LDL and the total generation requirement will be as estimated at future intervals. The Resource's HDL and LDL will be calculated for each interval of the projection based on the ramp rate capability over the study period. ERCOT shall estimate the projected total generation requirement by calculating a Load forecast for the study period. In lieu of the steps described in Section 6.5.7.3.1, Determination of Real-Time Reliability Deployment Price Adders, the non-binding projection of Real-Time Reliability Deployment Price Adders shall be estimated based on GTBD, reliability deployments MWs, and aggregated offers. The Energy Offer Curve and Energy Bid/Offer Curves from SCED Step 2, the virtual offers for Load Resources deployed and the power balance penalty curve will be compared against the updated GTBD to get an estimate of the System Lambda from paragraph (2)(m) of Section 6.5.7.3.1. ERCOT shall post the projected non-binding Base Points and Ancillary Service awards for each Resource for each interval study period on the MIS Certified Area and the projected non-binding LMPs for Resource Nodes, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders, Hub LMPs and Load Zone LMPs on the ERCOT website pursuant to Section 6.3.2, Activities for Real-Time Operations.

(16) ERCOT may override one or more of a Controllable Load Resource's parameters in SCED if ERCOT determines that the Controllable Load Resource's participation is having an adverse impact on the reliability of the ERCOT System.

(17) The QSE representing an ESR may withdraw energy from the ERCOT System only when dispatched by SCED to do so. An ESR may telemeter a status of OUT only if the ESR is in Outage status.

6.5.7.3.1 Determination of Real-Time On-Line Reliability Deployment Price Adder

(1) The following categories of reliability deployments are considered in the determination of the Real-Time On-Line Reliability Deployment Price Adder:

(a) RUC-committed Resources, except for those whose QSEs have opted out of RUC Settlement in accordance with paragraph (14) of Section 5.5.2, Reliability Unit Commitment (RUC) Process;

(b) RMR Resources that are On-Line, including capacity secured to prevent an Emergency Condition pursuant to paragraph (4) of Section 6.5.1.1, ERCOT Control Area Authority;

(c) Deployed Load Resources other than Controllable Load Resources;

(d) Deployed ERS;

(e) Real-Time DC Tie imports during an EEA where the total adjustment shall not exceed 1,250 MW in a single interval;

(f) Real-Time DC Tie exports to address emergency conditions in the receiving electric grid;

(g) Energy delivered to ERCOT through registered Block Load Transfers (BLTs) during an EEA;

(h) Energy delivered from ERCOT to another power pool through registered BLTs during emergency conditions in the receiving electric grid; and

(i) ERCOT-directed firm Load shed during EEA Level 3, as described in paragraph (3) of Section 6.5.9.4.2, EEA Levels.

(2) The Real-Time On-Line Reliability Deployment Price Adder is an estimation of the impact to energy prices due to the above categories of reliability deployments. For intervals where there are reliability deployments as described in paragraph (1) above, after the two-step SCED process and also after the Real-Time On-Line Reserve Price Adder and Real-Time Off-Line Reserve Price Adder have been determined, the Real-Time On-Line Reliability Deployment Price Adder is determined as follows:

(a) For RUC-committed Resources with a telemetered Resource Status of ONRUC and for RMR Resources that are On-Line, set the LSL, LASL, and LDL to zero.

(b) Notwithstanding item (a) above, for RUC-committed Combined Cycle Generation Resources with a telemetered Resource Status of ONRUC that were instructed by ERCOT to transition to a different configuration to provide additional capacity, set the LSL, LASL, and LDL equal to the minimum of their current value and the COP HSL of the QSE-committed configuration for the RUC hour at the snapshot time of the RUC instruction.

(c) For all other Generation Resources excluding ones with a telemetered status of ONRUC, ONTEST, STARTUP, SHUTDOWN, and also excluding RMR Resources that are On-Line and excluding Generation Resources with a telemetered output less than 95% of LSL:

(i) Set LDL to the greater of Aggregated Resource Output - (60 minutes * SCED Down Ramp Rate), or LASL; and

(ii) Set HDL to the lesser of Aggregated Resource Output + (60 minutes*SCED Up Ramp Rate), or HASL.

(d) For all Controllable Load Resources excluding ones with a telemetered status of OUTL:

(i) Set LDL to the greater of Aggregated Resource Output - (60 minutes * SCED Up Ramp Rate), or LASL; and

(ii) Set HDL to the lesser of Aggregated Resource Output + (60 minutes*SCED Down Ramp Rate), or HASL.

(e) Add the deployed MW from Load Resources that are not Controllable Load Resources and that are providing RRS to GTBD linearly ramped over the ten-minute ramp period and add the deployed MW from Load Resources that are not Controllable Load Resources providing Non-Spin to GTBD linearly ramped over the 30-minute ramp period. The amount of deployed MW is calculated from the Resource telemetry and from applicable deployment instructions in Extensible Markup Language (XML) messages. ERCOT shall generate a linear bid curve defined by a price/quantity pair of $300/MWh for the first MW of Load Resources deployed and a price/quantity pair of $700/MWh for the last MW of Load Resources deployed in each SCED execution. After recall instruction, the restoration period length and amount of MW added to GTBD during the restoration period will be determined by validated telemetry and the type of Ancillary Service deployed from the Resource. The TAC shall review the validity of the prices for the bid curve at least annually.

(f) Add the deployed MW from ERS to GTBD. The amount of deployed MW is determined from the XML messages and ERS contracted capacities for the ERS Time Periods when ERS is deployed. After recall, an approximation of the amount of un-restored ERS shall be used. After ERCOT recalls each group, GTBD shall be adjusted to reflect restoration on a linear curve over the assumed restoration period ("RHours").

The above parameter is defined as follows:

Parameter	Unit	Current Value*
RHours	Hours	4.5
* Changes to the current value of the parameter(s) referenced in this table above may be recommended by TAC and approved by the ERCOT Board. ERCOT shall update parameter values on the first day of the month following ERCOT Board approval unless otherwise directed by the ERCOT Board. ERCOT shall provide a Market Notice prior to implementation of a revised parameter value.		

(g) Add the MW from Real-Time DC Tie imports during an EEA to GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the ERCOT Operator.

(h) Subtract the MW from Real-Time DC Tie exports to address emergency conditions in the receiving electric grid from GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the receiving grid operator.

(i) Add the MW from energy delivered to ERCOT through registered BLTs during an EEA to GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the ERCOT Operator.

(j) Subtract the MW from energy delivered from ERCOT to another power pool through registered BLTs during emergency conditions in the receiving electric

grid from GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the receiving grid operator.

(k) Perform a SCED with changes to the inputs in items (a) through (j) above, considering only Competitive Constraints and the non-mitigated Energy Offer Curves.

(l) Perform mitigation on the submitted Energy Offer Curves using the LMPs from the previous step as the reference LMP.

(m) Perform a SCED with the changes to the inputs in items (a) through (j) above, considering both Competitive and Non-Competitive Constraints and the mitigated Energy offer Curves.

(n) Determine the positive difference between the System Lambda from item (m) above and the System Lambda of the second step in the two-step SCED process described in paragraph (10)(b) of Section 6.5.7.3, Security Constrained Economic Dispatch.

(o) Determine the amount given by the Value of Lost Load (VOLL) minus the sum of the System Lambda of the second step in the two step SCED process described in paragraph (10)(b) of Section 6.5.7.3 and the Real-Time On-Line Reserve Price Adder.

(p) The Real-Time On-Line Reliability Deployment Price Adder is the minimum of items (n) and (o) above except when ERCOT is directing firm Load shed during EEA Level 3. When ERCOT is directing firm Load shed during EEA Level 3 to either maintain sufficient PRC or stabilize grid frequency, as described in paragraph (3) of Section 6.5.9.4.2, the Real-Time On-Line Reliability Deployment Price Adder is the VOLL minus the sum of the System Lambda of the second step in the two-step SCED process described in paragraph (10)(b) of Section 6.5.7.3 and the Real-Time On-Line Reserve Price Adder. Once ERCOT is no longer directing firm Load shed, as described above, the Real-Time On-Line Reliability Deployment Price Adder will again be set as the minimum of items (n) and (o) above.

[NPRR904, NPRR1006, NPRR1010, NPRR1014, NPRR1091, NPRR1105, and NPRR1148: Replace applicable portions of Section 6.5.7.3.1 above with the following upon system implementation for NPRR904, NPRR1006, NPRR1014, NPRR1091, or NPRR1105; upon system implementation of NPRR863 for NPRR1148; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.3.1 Determination of Real-Time Reliability Deployment Price Adder

(1) The following categories of reliability deployments are considered in the determination of the Real-Time Reliability Deployment Price Adder for Energy, and the Real-Time Reliability Deployment Price Adders for Ancillary Services:

(a) RUC-committed Resources, except for those whose QSEs have opted out of RUC Settlement in accordance with paragraph (142) of Section 5.5.2, Reliability Unit Commitment (RUC) Process;

(b) RMR Resources that are On-Line, including capacity secured to prevent an Emergency Condition pursuant to paragraph (4) of Section 6.5.1.1, ERCOT Control Area Authority;

(c) Deployed Load Resources other than Controllable Load Resources;

(d) Deployed ERS;

(e) ERCOT-directed DC Tie imports during an EEA or transmission emergency where the total adjustment shall not exceed 1,250 MW in a single interval;

(f) ERCOT-directed curtailment of DC Tie imports below the higher of DC Tie advisory import limit as of 0600 in the Day-Ahead or subsequent advisory import limit to address local transmission system limitations where the total adjustment shall not exceed 1,250 MW in a single interval;

(g) ERCOT-directed curtailment of DC Tie imports below the higher of DC Tie advisory import limit as of 0600 in the Day-Ahead or subsequent advisory import limit due to an emergency action by a neighboring system operator during an emergency that is accommodated by ERCOT where the total adjustment shall not exceed 1,250 MW in a single interval;

(h) ERCOT-directed DC Tie exports to address emergency conditions in the receiving electric grid where the total adjustment shall not exceed 1,250 MW in a single interval;

(i) ERCOT-directed curtailment of DC Tie exports below the DC Tie advisory export limit as of 0600 in the Day-Ahead or subsequent advisory export limit during EEA, a transmission emergency, or to address local transmission system limitations where the total adjustment shall not exceed 1,250 MW in a single interval;

(j) Energy delivered to ERCOT through registered Block Load Transfers (BLTs) during an EEA;

(k) Energy delivered from ERCOT to another power pool through registered BLTs during emergency conditions in the receiving electric grid;

(l) ERCOT-directed deployment of TDSP standard offer Load management programs;

(m) ERCOT-directed deployment of distribution voltage reduction measures; and

(n) ERCOT-directed deployment of Off-Line Non-Spin.

(2) The Real-Time Reliability Deployment Price Adder for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Services are estimations of the impact to energy prices and Real-Time MCPCs due to the above categories of reliability deployments. For intervals where there are reliability deployments as described in paragraph (1) above, the Real-Time Reliability Deployment Price Adder for Energy and Real-Time Reliability Deployment Price Adders for Ancillary Services are determined as follows:

(a) For Off-Line Non-Spin Resources that are brought On-Line by ERCOT deployment instruction, RUC-committed Resources with a telemetered Resource Status of ONRUC and for RMR Resources that are On-Line:

(i) Set the LSL and LDL to zero;

(ii) Remove all Ancillary Service Offers; and

(iii) For the first step of SCED, administratively set the Energy Offer Curve for the Resource at a value equal to the power balance penalty price for all capacity between 0 MW and the HSL of the Resource.

(b) Notwithstanding item (a) above, for RUC-committed Combined Cycle Generation Resources with a telemetered Resource Status of ONRUC that were instructed by ERCOT to transition to a different configuration to provide additional capacity:

(i) Set the LSL and LDL equal to the minimum of their current value and the COP HSL of the QSE-committed configuration for the RUC hour at the snapshot time of the RUC instruction;

(ii) Set the maximum Ancillary Service capabilities of the Resource equal to the minimum of their current value and COP Ancillary Service capabilities of the QSE-committed configuration for the RUC hour at the snapshot time of the RUC instruction; and

(iii) For the first step of SCED, administratively set the Energy Offer Curve for the Resource at a value equal to the power balance penalty price for the additional capacity of the Resource, defined as the positive difference between the Resource's current telemetered HSL and the COP HSL of

the QSE-committed configuration for the RUC hour at the snapshot time of the RUC instruction.

(c) For all other Generation Resources excluding ones with a telemetered status of ONRUC, ONTEST, STARTUP, SHUTDOWN, and also excluding RMR Resources that are On-Line and excluding Generation Resources with a telemetered output less than 95% of LSL:

(i) If the Generation Resource SCED Base Point is not at LDL, set LDL to the greater of Aggregated Resource Output - (60 minutes * Normal Ramp Rate down), or LSL; and

(ii) If the Generation Resource SCED Base Point is not at HDL, set HDL to the lesser of Aggregated Resource Output + (60 minutes * Normal Ramp Rate up), or HSL.

(d) For all On-Line ESRs:

(i) If the ESR SCED Base Point is not at LDL, set LDL to the greater of Aggregated Resource Output - (60 minutes * Normal Ramp Rate down), or LSL; and

(ii) If the ESR SCED Base Point is not at HDL, set HDL to the lesser of Aggregated Resource Output + (60 minutes * Normal Ramp Rate up), or HSL.

(e) For all Controllable Load Resources excluding ones with a telemetered status of OUTL:

(i) If the Controllable Load Resource SCED Base Point is not at LDL, set LDL to the greater of Aggregated Resource Output - (60 minutes * Normal Ramp Rate down), or LSL; and

(ii) If the Controllable Load Resource SCED Base Point is not at HDL, set HDL to the lesser of Aggregated Resource Output + (60 minutes * Normal Ramp Rate up), or HSL.

(f) Add the deployed MW from Load Resources that are not Controllable Load Resources and that are providing RRS or ECRS to GTBD linearly ramped over the ten-minute ramp period and add the deployed MW from Load Resources that are not Controllable Load Resources providing Non-Spin to GTBD linearly ramped over the 30-minute ramp period. The amount of deployed MW is calculated from the Resource telemetry and from applicable deployment instructions in Extensible Markup Language (XML) messages. ERCOT shall generate a linear bid curve defined by a price/quantity pair of $300/MWh for the first MW of Load Resources deployed and a price/quantity pair of $700/MWh for the last MW of Load Resources deployed in each SCED execution. After

recall instruction, the restoration period length and amount of MW added to GTBD during the restoration period will be determined by validated telemetry and the type of Ancillary Service deployed from the Resource. The TAC shall review the validity of the prices for the bid curve at least annually.

(g) Add the deployed MW from ERS to GTBD. The amount of deployed MW is determined from the XML messages and ERS contracted capacities for the ERS Time Periods when ERS is deployed. After recall, an approximation of the amount of un-restored ERS shall be used. After ERCOT recalls each group, GTBD shall be adjusted to reflect restoration on a linear curve over the assumed restoration period ("RHours").

The above parameter is defined as follows:

Parameter	Unit	Current Value*
RHours	Hours	4.5
* Changes to the current value of the parameter(s) referenced in this table above may be recommended by TAC and approved by the ERCOT Board. ERCOT shall update parameter values on the first day of the month following ERCOT Board approval unless otherwise directed by the ERCOT Board. ERCOT shall provide a Market Notice prior to implementation of a revised parameter value.		

(h) Add the MW from DC Tie imports during an EEA or transmission emergency, to address local transmission system limitations, or due to an emergency action by a neighboring system operator during an emergency that is accommodated by ERCOT to GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the ERCOT Operator.

(i) Add the MW from DC Tie export curtailments during an EEA or transmission emergency, to address local transmission system limitations, or due to an emergency action by a neighboring system operator during an emergency that is accommodated by ERCOT to GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the ERCOT Operator. The MW added to GTBD associated with any individual DC Tie shall not exceed the higher of DC Tie advisory limit for exports on that tie as of 0600 in the Day-Ahead or subsequent advisory export limit minus the aggregate export on the DC Tie that remained scheduled following the Dispatch Instruction from the ERCOT Operator.

(j) Subtract the MW from DC Tie exports to address emergency conditions in the receiving electric grid from GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the receiving grid operator.

(k) Subtract the MW from DC Tie import curtailments to address local transmission system limitations or emergency conditions in the receiving electric grid from GTBD. The amount of MW is determined from the Dispatch Instruction and

should continue over the duration of time specified by the receiving grid operator. The MW subtracted from GTBD associated with any individual DC Tie shall not exceed the higher of DC Tie advisory limit for imports on that tie as of 0600 in the Day-Ahead or subsequent advisory import limit minus the aggregate import on the DC Tie that remained scheduled following the Dispatch Instruction from the ERCOT Operator.

(l) Add the MW from energy delivered to ERCOT through registered BLTs during an EEA to GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the ERCOT Operator.

(m) Subtract the MW from energy delivered from ERCOT to another power pool through registered BLTs during emergency conditions in the receiving electric grid from GTBD. The amount of MW is determined from the Dispatch Instruction and should continue over the duration of time specified by the receiving grid operator.

(n) Add the deployed MWs from TDSP standard offer Load management programs to GTBD, if ERCOT instructs TDSPs to deploy their standard offer Load management programs. The amount of deployed MW is the value ERCOT provided for all TDSP standard offer Load management programs in the most current May Report on Capacity, Demand and Reserves in the ERCOT Region, unless modified as specified in this paragraph. If ERCOT is informed that all or a portion of a TDSP's standard offer Load management program has been fully exhausted, or has been expanded as the result of a Public Utility Commission of Texas (PUCT) proceeding, ERCOT will remove the associated MW value of any exhausted capacity from the amount of deployed MW or, in the case of an expansion, ERCOT will request an updated MW value from the relevant TDSPs to use in place of the May Report on Capacity, Demand and Reserves in the ERCOT Region value for that year. The initial value ERCOT will use for deployed MW under this paragraph for each calendar year, as well as any subsequent changes to this value, will be communicated to Market Participants in a Market Notice. After recall, an approximation of the amount of un-restored TDSP standard offer Load management programs shall be used. GTBD shall be adjusted to reflect restoration on a linear curve over the assumed restoration period ("RHours") defined by item (g) above.

(o) Perform a SCED with changes to the inputs in items (a) through (m) above, considering only Competitive Constraints and the non-mitigated Energy Offer Curves.

(p) Perform mitigation on the submitted Energy Offer Curves using the LMPs from the previous step as the reference LMP.

(q) Perform a SCED with the changes to the inputs in items (a) through (m) above, considering both Competitive and Non-Competitive Constraints and the mitigated Energy Offer Curves.

(r) The Real-Time Reliability Deployment Price Adder for Energy is equal to the positive difference between the System Lambda from item (q) above and the System Lambda of the second step in the two-step SCED process described in paragraph (10)(b) of Section 6.5.7.3, Security Constrained Economic Dispatch.

(s) For each individual Ancillary Service, the Real-Time Reliability Deployment Price Adder for Ancillary Service is equal to the positive difference between the MCPC for that Ancillary Service from item (q) above and the MCPC for that Ancillary Service.

6.5.7.4 Base Points

(1) ERCOT shall issue a Base Point for each On-Line Generation Resource and each On-Line Controllable Load Resource on completion of each SCED execution. The Base Point set by SCED must observe a Generation Resource's and Controllable Load Resource's HDL and LDL. Base Points are automatically superseded on receipt of a new Base Point from ERCOT regardless of the status of any current ramping activity of a Resource. ERCOT shall provide each Base Point using Dispatch Instructions issued over Inter-Control Center Communications Protocol (ICCP) data link to the QSE representing each Resource that include the following information:

(a) Resource identifier that is the subject of the Dispatch Instruction;

(b) MW output for Generation Resource and MW consumption for Controllable Load Resource;

(c) Time of the Dispatch Instruction;

(d) Flag indicating SCED has dispatched a Generation Resource or Controllable Load Resource below HDL used by SCED;

[NPRR1111: Replace paragraph (d) above with the following upon system implementation of SCR819:]

(d) Flag indicating SCED has dispatched a Generation Resource or Controllable Load Resource below HDL used by SCED or an IRR has been instructed not to exceed its Base Point;

[NPRR285: Insert paragraph (e) below upon system implementation and renumber accordingly:]

(e) Flag indicating SCED has dispatched a Generation Resource away from the Output Schedule submitted for that Generation Resource;

(e) Flag indicating that the Resource is identified for mitigation pursuant to paragraph (7) of Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, and paragraph (10) of Section 6.5.7.3, Security Constrained Economic Dispatch; and

(f) Other information relevant to that Dispatch Instruction.

[NPRR1010: Insert Section 6.5.7.4.1 below upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.5.7.4.1 Updated Desired Set Points

(1) Each Resource shall follow ERCOT-issued Updated Desired Set Points (UDSPs), unless otherwise instructed by ERCOT. ERCOT-issued UDSPs shall not include expected Primary Frequency Response.

(2) A UDSP is the sum of a calculated MW value representing the expected MW output of a Resource ramping to a SCED Base Point and the Resource-specific Regulation Service instruction from ERCOT.

(3) LFC shall send Resource-specific UDSP to QSEs every four seconds.

(4) Resources, excluding non-Controllable Load Resources, that have been awarded RRS as FFR-capable Resources or are telemetering a Resource Status of ONSC, will all have manual deployment instructions and expected deployments triggered automatically by frequency deviations included in the UDSP value provided to the QSE for the Resource. These deployment components of UDSP will reflect the latest Ancillary Service awards and are separate from the ramping component of UDSP.

(5) When ERCOT System frequency experiences a 0.05 Hz or greater deviation from scheduled frequency, and a Resource is ramping to a SCED Base Point in a manner directionally opposite to system frequency, the ramping component of the Resource's UDSP will be temporarily held constant and flagged accordingly.

6.5.7.5 Ancillary Services Capacity Monitor

(1) ERCOT shall calculate the following every ten seconds and provide Real-Time summaries to ERCOT Operators and all Market Participants using ICCP, giving updates of calculations every ten seconds, and posting on the ERCOT website, giving updates of calculations every five minutes, which show the Real-Time total system amount of:

(a) RRS capacity from:

(i) Generation Resources;

(ii) Load Resources excluding Controllable Load Resources;

(iii) Controllable Load Resources; and

(iv) Resources capable of Fast Frequency Response (FFR);

(b) Ancillary Service Resource Responsibility for RRS from:

(i) Generation Resources;

(ii) Load Resources excluding Controllable Load Resources;

(iii) Controllable Load Resources; and

(iv) Resources capable of FFR;

(c) RRS deployed to Generation and Controllable Load Resources;

(d) Non-Spin available from:

(i) On-Line Generation Resources with Energy Offer Curves;

(ii) Undeployed Load Resources;

(iii) Off-Line Generation Resources; and

(iv) Resources with Output Schedules;

(e) Ancillary Service Resource Responsibility for Non-Spin from:

(i) On-Line Generation Resources with Energy Offer Curves;

(ii) On-Line Generation Resources with Output Schedules;

(iii) Load Resources;

(iv) Off-Line Generation Resources excluding Quick Start Generation Resources (QSGRs); and

(v) QSGRs;

(f) Undeployed Reg-Up and Reg-Down;

(g) Ancillary Service Resource Responsibility for Reg-Up and Reg-Down;

(h) Deployed Reg-Up and Reg-Down;

(i) Available capacity:

(i) With Energy Offer Curves in the ERCOT System that can be used to increase Generation Resource Base Points in SCED;

(ii) With Energy Offer Curves in the ERCOT System that can be used to decrease Generation Resource Base Points in SCED;

(iii) Without Energy Offer Curves in the ERCOT System that can be used to increase Generation Resource Base Points in SCED;

(iv) Without Energy Offer Curves in the ERCOT System that can be used to decrease Generation Resource Base Points in SCED;

(v) With RTM Energy Bid curves from available Controllable Load Resources in the ERCOT System that can be used to decrease Base Points (energy consumption) in SCED;

(vi) With RTM Energy Bid curves from available Controllable Load Resources in the ERCOT System that can be used to increase Base Points (energy consumption) in SCED;

(vii) From Resources participating in SCED plus the Reg-Up and RRS from Load Resources and the Net Power Consumption minus the Low Power Consumption from Load Resources with a validated Real-Time RRS Schedule;

(viii) From Resources included in item (vii) above plus reserves from Resources that could be made available to SCED in 30 minutes;

(ix) In the ERCOT System that can be used to increase Generation Resource Base Points in the next five minutes in SCED; and

(x) In the ERCOT System that can be used to decrease Generation Resource Base Points in the next five minutes in SCED;

(j) Aggregate telemetered HSL capacity for Resources with a telemetered Resource Status of EMR;

(k) Aggregate telemetered HSL capacity for Resources with a telemetered Resource Status of OUT;

(l) Aggregate net telemetered consumption for Resources with a telemetered Resource Status of OUTL; and

(m) The ERCOT-wide PRC calculated as follows:

$$PRC_1 = \sum_{\substack{i=\text{online}\\ \text{generation}\\ \text{resource}}}^{\substack{\text{All}\\ \text{online}\\ \text{generation}\\ \text{resources}}} \textbf{Min(Max((RDF*(HSL-NFRC) – Actual Net Telemetered Output)}_i\textbf{ , 0.0) , 0.2*RDF*(HSL-NFRC)}_i\textbf{),}$$

where the included On-Line Generation Resources do not include WGRs, nuclear Generation Resources, or Generation Resources with an output less than or equal to 95% of telemetered LSL or with a telemetered status of ONTEST, STARTUP, or SHUTDOWN.

$$PRC_2 = \sum_{\substack{i=\text{online}\\ \text{WGR}}}^{\substack{\text{All}\\ \text{online}\\ \text{WGRs}}} \textbf{Min(Max((RDF}_W\textbf{*HSL – Actual Net Telemetered Output)}_i\textbf{ , 0.0) , 0.2*RDF}_W\textbf{*HSL}_i\textbf{),}$$

where the included On-Line WGRs only include WGRs that are Primary Frequency Response-capable.

$$PRC_3 = \sum_{\substack{i=\text{online}\\ \text{generation}\\ \text{resource}}}^{\substack{\text{All}\\ \text{online}\\ \text{generation}\\ \text{resources}}} \textbf{((Hydro-synchronous condenser output)}_i\textbf{ as qualified by item (8) of Operating Guide Section 2.3.1.2, Additional Operational Details for Responsive Reserve Providers))}$$

$$PRC_4 = \sum_{\substack{i=\text{online}\\ \text{load}\\ \text{resource}}}^{\substack{\text{All}\\ \text{online}\\ \text{load}\\ \text{resources}}} \textbf{(Min(Max((Actual Net Telemetered Consumption – LPC), 0.0), RRS Ancillary Service Resource Responsibility * 1.5) from all Load Resources controlled by high-set under frequency relays carrying RRS Ancillary Service Resource Responsibility)}_i$$

$$PRC_5 = \sum_{i=\text{online load resource}}^{\text{All online load resources}}$$ **Min(Max((LRDF_1*Actual Net Telemetered Consumption – LPC)$_i$, 0.0), (0.2 * LRDF_1 * Actual Net Telemetered Consumption)) from all Controllable Load Resources active in SCED and carrying Ancillary Service Resource Responsibility**

$$PRC_6 = \sum_{i=\text{online load resource}}^{\text{All online load resources}}$$ **Min(Max((LRDF_2 * Actual Net Telemetered Consumption – LPC)$_i$, 0.0), (0.2 * LRDF_2 * Actual Net Telemetered Consumption)) from all Controllable Load Resources active in SCED and not carrying Ancillary Service Resource Responsibility**

$$PRC_7 = \sum_{i=\text{online FFR resource}}^{\text{All online FFR resources}}$$ **(Capacity from Resources capable of providing FFR)$_i$**

$$PRC_8 = \sum_{i=\text{online ESR}}^{\text{All online ESR}}$$ **(If discharging or idle, Min(X% of HSL based on droop, HSL-ESR-Gen "injection", the capacity that can be sustained for 15 minutes per the State of Charge), else Min(X% of (HSL – LSL(ESR "charging") based on droop, the capacity that can be sustained for 15 minutes per the State of Charge – LSL(ESR "charging")))**

Excludes ESR capacity used to provide FFR

$PRC = PRC_1 + PRC_2 + PRC_3 + PRC_4 + PRC_5 + PRC_6 + PRC_7 + PRC_8$

The above variables are defined as follows:

Variable	Unit	Description
PRC_1	MW	Generation On-Line greater than 0 MW
PRC_2	MW	WGRs On-Line greater than 0 MW
PRC_3	MW	Hydro-synchronous condenser output

PRC_4	MW	Capacity from Load Resources controlled by high-set under-frequency relays carrying RRS Ancillary Service Resource Responsibility
PRC_5	MW	Capacity from Controllable Load Resources active in SCED and carrying Ancillary Service Resource Responsibility
PRC_6	MW	Capacity from Controllable Load Resources active in SCED and not carrying Ancillary Service Resource Responsibility
PRC_7	MW	Capacity from Resources capable of providing FFR
PRC_8	MW	ESR capacity capable of providing Primary Frequency Response
PRC	MW	Physical Responsive Capability
X	Percentage	Percent threshold based on the Governor droop setting of ESRs
RDF		The currently approved Reserve Discount Factor
RDF_W		The currently approved Reserve Discount Factor for WGRs
LRDF_1		The currently approved Load Resource Reserve Discount Factor for Controllable Load Resources carrying Ancillary Service Resource Responsibility
LRDF_2		The currently approved Load Resource Reserve Discount Factor for Controllable Load Resources not carrying Ancillary Service Resource Responsibility
NFRC	MW	Non-Frequency Responsive Capacity

(2) Each QSE shall operate Resources providing Ancillary Service capacity to meet its obligations. If a QSE experiences temporary conditions where its total obligation for providing Ancillary Service cannot be met on the QSE's Resources, then the QSE may add additional capability from other Resources that it represents. It adds that capability by changing the Resource Status and updating the Ancillary Service Schedules and Ancillary Services Resource Responsibility of the affected Resources and notifying ERCOT under Section 6.4.9.1, Evaluation and Maintenance of Ancillary Service Capacity Sufficiency. If the QSE is unable to meet its total obligations to provide committed Ancillary Services capacity, the QSE shall notify ERCOT immediately of the expected duration of the QSE's inability to meet its obligations. ERCOT shall determine whether replacement Ancillary Services will be procured to account for the QSE's shortfall according to Section 6.4.9.1.

(3) The Load Resource Reserve Discount Factors (RDFs) for Controllable Load Resources (LRDF_1 and LRDF_2) shall be subject to review and approval by TAC.

(4) The RDFs used in the PRC calculation shall be posted to the ERCOT website no later than three Business Days after approval.

[NPRR863, NPRR1010, NPRR1014, NPRR1029, and NPRR1085: Replace applicable portions of Section 6.5.7.5 above with the following upon system implementation for NPRR863, NPRR1014, NPRR1029, or NPRR1085; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.5 Ancillary Services Capacity Monitor

(1) Every ten seconds, ERCOT shall calculate the following and provide Real-Time summaries to ERCOT Operators and all Market Participants using ICCP and postings on the ERCOT website showing the Real-Time total system amount of:

(a) RRS capability from:

(i) Generation Resources and ESRs in the form of PFR;

(ii) Load Resources, excluding Controllable Load Resources, capable of responding via under-frequency relay;

(iii) Controllable Load Resources in the form of PFR; and

(iv) Resources capable of Fast Frequency Response (FFR);

(b) Ancillary Service Resource awards for RRS to:

(i) Generation Resources and ESRs in the form of PFR;

(ii) Load Resources, excluding Controllable Load Resources, capable of responding by under-frequency relay;

(iii) Controllable Load Resources in the form of PFR; and

(iv) Resources providing FFR;

(c) ECRS capability from:

(i) Generation Resources;

(ii) Load Resources excluding Controllable Load Resources;

(iii) Controllable Load Resources;

(iv) Quick Start Generation Resources (QSGRs); and

(v) ESRs.

(d) Ancillary Service Resource awards for ECRS to:

(i) Generation Resources;

(ii) Load Resources excluding Controllable Load Resources; and

(iii) Controllable Load Resources;

(iv) QSGRs; and

(v) ESRs.

(e) ECRS manually deployed by Resources with a Resource Status of ONSC;

(f) Non-Spin available from:

(i) On-Line Generation Resources with Energy Offer Curves;

(ii) Undeployed Load Resources;

(iii) Off-Line Generation Resources and On-Line Generation Resources with power augmentation;

(iv) Resources with Output Schedules; and

(v) ESRs.

(g) Ancillary Service Resource awards for Non-Spin to:

(i) On-Line Generation Resources with Energy Offer Curves;

(ii) On-Line Generation Resources with Output Schedules;

(iii) Load Resources;

(iv) Off-Line Generation Resources excluding Quick Start Generation Resources (QSGRs), including Non-Spin awards on power augmentation capacity that is not active on On-Line Generation Resources;

(v) QSGRs; and

(vi) ESRs.

(h) Reg-Up and Reg-Down capability;

(i) Undeployed Reg-Up and Reg-Down;

(j) Ancillary Service Resource awards for Reg-Up and Reg-Down;

(k) Deployed Reg-Up and Reg-Down;

(l) Available capacity:

(i) With Energy Offer Curves in the ERCOT System that can be used to increase Generation Resource Base Points in SCED;

(ii) With Energy Offer Curves in the ERCOT System that can be used to decrease Generation Resource Base Points in SCED;

(iii) Without Energy Offer Curves in the ERCOT System that can be used to increase Generation Resource Base Points in SCED;

(iv) Without Energy Offer Curves in the ERCOT System that can be used to decrease Generation Resource Base Points in SCED;

(v) With RTM Energy Bid curves from available Controllable Load Resources in the ERCOT System that can be used to decrease Base Points (energy consumption) in SCED;

(vi) With RTM Energy Bid curves from available Controllable Load Resources in the ERCOT System that can be used to increase Base Points (energy consumption) in SCED;

(vii) From Resources participating in SCED plus the Reg-Up, RRS, and ECRS from Load Resources and the Net Power Consumption minus the Low Power Consumption from Load Resources with a validated Real-Time RRS and ECRS awards;

(viii) With Energy Bid/Offer Curves for ESRs in the ERCOT System that can be used to increase ESR Base Points in SCED;

(ix) With Energy Bid/Offer Curves for ESRs in the ERCOT System that can be used to decrease ESR Base Points in SCED;

(x) Without Energy Bid/Offer Curves for ESRs in the ERCOT System that can be used to increase ESR Base Points in SCED;

(xi) Without Energy Bid/Offer Curves for ESRs in the ERCOT System that can be used to decrease ESR Base Points in SCED;

(xii) From Resources included in item (vii) above plus reserves from Resources that could be made available to SCED in 30 minutes;

(xiii) In the ERCOT System that can be used to increase Generation Resource Base Points in the next five minutes in SCED; and

(xiv) In the ERCOT System that can be used to decrease Generation Resource Base Points in the next five minutes in SCED;

(xv) The total capability of Resources available to provide the following combinations of Ancillary Services, based on the Resource telemetry from the QSE and capped by the limits of the Resource:

(A) Capacity to provide Reg-Up, RRS, or both, irrespective of whether it is capable of providing ECRS or Non-Spin;

(B) Capacity to provide Reg-Up, RRS, ECRS, or any combination, irrespective of whether it is capable of providing Non-Spin; and

(C) Capacity to provide Reg-Up, RRS, ECRS, or Non-Spin, in any combination;

(m) Aggregate telemetered HSL capacity for Resources with a telemetered Resource Status of EMR;

(n) Aggregate telemetered HSL capacity for Resources with a telemetered Resource Status of OUT;

(o) Aggregate net telemetered consumption for Resources with a telemetered Resource Status of OUTL; and

(p) The ERCOT-wide PRC calculated as follows:

$$PRC_1 = \sum_{i=\text{online generation resource}}^{\text{All online generation resources}} \text{Min}(\text{Max}((RDF*FRCHL - FRCO)_i, 0.0), 0.2*RDF*FRCHL_i),$$

where the included On-Line Generation Resources do not include WGRs, nuclear Generation Resources, or Generation Resources with an output less than or equal to 95% of telemetered LSL with a telemetered status of ONTEST, ONHOLD, STARTUP, or SHUTDOWN.

$$PRC_2 = \sum_{i=\text{online WGR}}^{\text{All online WGRs}} \text{Min}(\text{Max}((RDF_W*HSL - \text{Actual Net Telemetered Output})_i, 0.0), 0.2*RDF_W*HSL_i),$$

where the included On-Line WGRs only include WGRs that are Primary Frequency Response-capable.

$PRC_3 = \sum_{i=\text{online generation resource}}^{\text{All online generation resources}}$ **((Synchronous condenser output)$_i$ as qualified by item (8) of Operating Guide Section 2.3.1.2, Additional Operational Details for Responsive Reserve and ERCOT Contingency Reserve Service Providers))**

$PRC_4 = \sum_{i=\text{online load resource}}^{\text{All online load resources}}$ **(Min(Max((Actual Net Telemetered Consumption – LPC), 0.0), ECRS and RRS Ancillary Service Resource award * 1.5) from all Load Resources controlled by high-set under-frequency relays with an ECRS and/or RRS Ancillary Service Resource award)$_i$**

$PRC_5 = \sum_{i=\text{online load resource}}^{\text{All online load resources}}$ **Min(Max((LRDF_1*Actual Net Telemetered Consumption – LPC)$_i$, 0.0), (0.2 * LRDF_1 * Actual Net Telemetered Consumption)) from all Controllable Load Resources active in SCED with an Ancillary Service Resource award**

$PRC_6 = \sum_{i=\text{online load resource}}^{\text{All online load resources}}$ **Min(Max((LRDF_2 * Actual Net Telemetered Consumption – LPC)$_i$, 0.0), (0.2 * LRDF_2 * Actual Net Telemetered Consumption)) from all Controllable Load Resources active in SCED without an Ancillary Service Resource award**

$PRC_7 = \sum_{i=\text{online FFR resource}}^{\text{All online FFR resources}}$ **(Capacity from Resources capable of providing FFR)$_i$**

$$PRC_8 = \sum_{i=online\ ESR}^{All\ online\ ESR}$$

(If discharging or idle, Min(X% of HSL based on droop, HSL-ESR-Gen "injection", the capacity that can be sustained for 15 minutes per the State of Charge), else Min(X% of (HSL – LSL(ESR "charging") based on droop, the capacity that can be sustained for 15 minutes per the State of Charge – LSL(ESR "charging")))

Excludes ESR capacity used to provide FFR

$$PRC_9 = \sum_{i=online\ ESR}^{All\ online\ DC\text{-}Coupled\ Resources}$$

(If discharging or idle, Min(X% of HSL based on droop, HSL-Gen "injection", the sum of the MW headroom available from the intermittent renewable generation component and the MW capacity that can be sustained for 15 minutes per the ESS State of Charge), else Min(X% of Real-Time Total Capacity based on droop, the sum of the MW headroom available from the intermittent renewable generation component and the MW capacity that can be sustained for 15 minutes per the ESS State of Charge))

Excludes DC-Coupled Resource capacity used to provide FFR

$$PRC = PRC_1 + PRC_2 + PRC_3 + PRC_4 + PRC_5 + PRC_6 + PRC_7 + PRC_8 + PRC_9$$

The above variables are defined as follows:

Variable	Unit	Description
PRC_1	MW	Generation On-Line greater than 0 MW
PRC_2	MW	WGRs On-Line greater than 0 MW
PRC_3	MW	Synchronous condenser output
PRC_4	MW	Capacity from Load Resources with an ECRS Ancillary Service Resource award
PRC_5	MW	Capacity from Controllable Load Resources active in SCED with an Ancillary Service Resource award
PRC_6	MW	Capacity from Controllable Load Resources active in SCED without an Ancillary Service Resource award
PRC_7	MW	Capacity from Resources capable of providing FFR
PRC_8	MW	ESR capacity capable of providing Primary Frequency Response
PRC_9	MW	Capacity from DC-Coupled Resources capable of providing Primary Frequency Response

PRC	MW	Physical Responsive Capability
X	Percentage	Percent threshold based on the Governor droop setting of ESRs
RDF		The currently approved Reserve Discount Factor
RDF_W		The currently approved Reserve Discount Factor for WGRs
LRDF_1		The currently approved Load Resource Reserve Discount Factor for Controllable Load Resources awarded an Ancillary Service Resource award
LRDF_2		The currently approved Load Resource Reserve Discount Factor for Controllable Load Resources not awarded an Ancillary Service Resource award
FRCHL	MW	Telemetered High limit of the FRC for the Resource
FRCO	MW	Telemetered output of FRC portion of the Resource

(2) The Load Resource Reserve Discount Factors (RDFs) for Controllable Load Resources (LRDF_1 and LRDF_2) shall be subject to review and approval by TAC.

(3) The RDFs used in the PRC calculation shall be posted to the ERCOT website no later than three Business Days after approval.

(4) ERCOT shall display on the ERCOT website and update every ten seconds a rolling view of the ERCOT-wide PRC, as defined in paragraph (1)(p) above, for the current Operating Day.

6.5.7.6 Load Frequency Control

(1) The function of LFC is to maintain system frequency without a cost optimization function. ERCOT shall execute LFC every four seconds to reduce system frequency deviations from scheduled frequency by providing a control signal to each QSE that represents Resources providing Regulation Service and RRS service.

[NPRR863: Replace paragraph (1) above with the following upon system implementation:]

(1) The function of LFC is to maintain system frequency without a cost optimization function. ERCOT shall execute LFC every four seconds to reduce system frequency deviations from scheduled frequency by providing a control signal to each QSE that represents Resources providing Regulation Service, RRS, and ECRS.

6.5.7.6.1 LFC Process Description

(1) The LFC system corrects system frequency based on the Area Control Error (ACE) algorithm and Good Utility Practice.

(2) The ACE algorithm subtracts the actual frequency in Hz from the scheduled system frequency (normally 60 Hz), and multiplies the result by the frequency bias constant of MW/0.1 Hz. The ACE algorithm then takes that product and subtracts a configurable portion of the sum of the difference between the Updated Desired Base Point and Real-Time net MW output as appropriate. LFC shall ensure that the total reduction will not exceed the system-wide regulation requirement. This calculation produces an ACE value, which is a MW-equivalent correction needed to control the actual system frequency to the scheduled system frequency value.

(3) The LFC module receives inputs from Real-Time telemetry that includes Resource output and actual system frequency. The LFC uses actual Resource information calculated from SCADA to determine available Resource capacity providing Regulation and RRS services.

(4) Based on the ACE MW correction, the LFC issues a set of control signals every four seconds to each QSE providing Regulation and, if required, each QSE providing RRS. Control must be proportional to the QSE's share of each of the services that it is providing, respecting the QSE's Resources' capability to provide regulation control. Control signals are provided to the QSE using the ICCP data link. QSEs shall receive an Updated Desired Base Point updated every four seconds by LFC. ERCOT will provide an Operations Notice of any methodology change to the determination of the Updated Desired Base Point within 60 minutes of the change.

(5) Each QSE shall allocate its Regulation energy deployment among its Resources to meet a deployment signal, and shall provide ERCOT with the participation factor of each Resource via telemetry in accordance with Section 6.5.7.6.2.1, Deployment of Regulation Service, and Section 6.4.9.1, Evaluation and Maintenance of Ancillary Service Capacity Sufficiency. A QSE may allocate Regulation Service Ancillary Service Resource Responsibility to any Resource telemetering a Resource Status of ONOPTOUT. Each QSE's allocation of Regulation Service to its Resources must be consistent with the telemetry provided under Section 6.5.5.2, Operational Data Requirements. Each QSE's allocation of its Regulation energy deployment among its Resources to meet a deployment signal must ensure the participation factors of all its Generation Resources in comparison to all its Controllable Load Resources remains constant.

[NPRR1092: Replace paragraph (5) above with the following upon system implementation:]

(5) Each QSE shall allocate its Regulation energy deployment among its Resources to meet a deployment signal, and shall provide ERCOT with the participation factor of each Resource via telemetry in accordance with Section 6.5.7.6.2.1, Deployment of Regulation Service, and Section 6.4.9.1, Evaluation and Maintenance of Ancillary Service Capacity Sufficiency. A QSE may allocate Regulation Service Ancillary Service Resource Responsibility to any Resource that has successfully opted out of RUC Settlement. Each QSE's allocation of Regulation Service to its Resources must be consistent with the telemetry provided under Section 6.5.5.2, Operational Data Requirements. Each QSE's allocation of its Regulation energy deployment among its Resources to meet a

deployment signal must ensure the participation factors of all its Generation Resources in comparison to all its Controllable Load Resources remains constant.

(6) If all Reg-Up capacity has been deployed, ERCOT shall use the LFC system to deploy Responsive Reserve on Generation Resources and Controllable Load Resources. Such Responsive Reserve deployments by ERCOT must be deployed as specified in Section 6.5.7.6.2.2, Deployment of Responsive Reserve Service.

(7) ERCOT shall settle energy that results from LFC deployment at the Settlement Point Price for the point of injection. When a QSE deploys Responsive Reserve Service, the QSE shall deploy units consistent with the performance criteria for RRS service in Sections 8.1.1.3.2, Responsive Reserve Capacity Monitoring Criteria, and 8.1.1.4.2, Responsive Reserve Service Energy Deployment Criteria.

(8) The inputs for LFC include:

(a) Actual system frequency;

(b) Scheduled system frequency;

(c) Capacity available for Regulation by QSE;

(d) Telemetered high and low Regulation availability status indications for each Resource available for Regulation deployments for ERCOT information;

(e) Resource limits calculated by ERCOT as described Section 6.5.7.2, Resource Limit Calculator;

(f) Resource Regulation participation factor;

(g) Capacity available for RRS by QSE;

(h) ERCOT System frequency bias; and

(i) Telemetered Resource output.

(9) If system frequency deviation is greater than an established threshold, ERCOT may issue Dispatch Instructions to those Resources not providing Reg-Up or Reg-Down that have Base Points directionally opposite ACE, to temporarily suspend ramping to their Base Point until frequency deviation returns to zero.

[NPRR863 and NPRR1010: Replace applicable portions of Section 6.5.7.6.1 above with the following upon system implementation for NPRR863; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.6.1 LFC Process Description

(1) The LFC system corrects system frequency based on the Area Control Error (ACE) algorithm and Good Utility Practice.

(2) The ACE algorithm subtracts the actual frequency in Hz from the scheduled system frequency (normally 60 Hz), and multiplies the result by the frequency bias constant of MW/0.1 Hz. The ACE algorithm then takes that product and subtracts a configurable portion of the sum of the difference between the Updated Desired Set Point (UDSP) and Real-Time net MW output as appropriate. LFC shall ensure that the total reduction will not exceed the system-wide regulation requirement. This calculation produces an ACE value, which is a MW-equivalent correction needed to control the actual system frequency to the scheduled system frequency value.

(3) The LFC module receives inputs from Real-Time telemetry that includes Resource output and actual system frequency. The LFC uses actual Resource information calculated from SCADA to determine available Resource capacity providing Regulation Service, RRS, and ECRS.

(4) Based on the ACE MW correction, the LFC issues a set of control signals every four seconds for each Resource providing Regulation and, if required, each Resource providing RRS or ECRS. Control signals to each Resource are provided to the QSE using the ICCP data link. QSEs shall receive a UDSP updated every four seconds by LFC. ERCOT will provide an operations notice of any methodology change to the determination of the UDSP within 60 minutes of the change.

(5) If all Reg-Up capacity has been deployed, ERCOT shall run off-cycle SCED executions or use the LFC system to deploy ECRS on Resources providing FFR or with an ONSC Resource Status. Such ECRS deployments by ERCOT must be deployed as specified in Section 6.5.7.6.2.4, Deployment and Recall of ERCOT Contingency Reserve Service.

(6) ERCOT shall settle energy that results from LFC deployment at the Settlement Point Price for the point of injection. When a QSE deploys RRS or ECRS, the QSE shall deploy units consistent with the performance criteria in Sections 8.1.1.3.2, Responsive Reserve Capacity Monitoring Criteria, Section 8.1.1.3.4, ERCOT Contingency Reserve Service Capacity Monitoring Criteria, 8.1.1.4.2, Responsive Reserve Energy Deployment Criteria, and 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria.

(7) The inputs for LFC include:

(a) Actual system frequency;

(b) Scheduled system frequency;

(c) Capacity awarded for Regulation Service to Resources;

(d) For Resources awarded Regulation Service, telemetered HSL or MPC, and LSL or LPC;

(e) Resource limits calculated by ERCOT as described in Section 6.5.7.2, Resource Limit Calculator;

(f) Capacity awarded for RRS and ECRS to Resources;

(g) ERCOT System frequency bias; and

(h) Telemetered Resource output.

6.5.7.6.2 LFC Deployment

(1) ERCOT may deploy Regulation Service, RRS, and Non-Spin only as prescribed by their respective specific functions to maintain frequency and system security. ERCOT may not substitute one Ancillary Service for another.

[NPRR863: Replace paragraph (1) above with the following upon system implementation:]

(1) ERCOT may deploy Regulation Service, RRS, ECRS, and Non-Spin only as prescribed by their respective specific functions to maintain frequency and system security. ERCOT may not substitute one Ancillary Service for another.

[NPRR1010: Insert paragraph (2) below upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(2) LFC will send UDSP deployment signals for each Resource, as specified in Section 6.5.7.4.1, Updated Desired Set Points.

6.5.7.6.2.1 Deployment of Regulation Service

(1) ERCOT shall deploy Reg-Up and Reg-Down necessary to maintain ERCOT System frequency to meet NERC Control Area and other Control Area performance criteria as specified in these Protocols and the Operating Guides.

(2) Reg-Up is a deployment or recall of a deployment referenced to the Resource's Base Point in response to a change (up or down) in ERCOT System frequency to maintain the

target ERCOT System frequency within predetermined limits according to the Operating Guides.

(3) Reg-Down is a deployment or recall of a deployment referenced to the Resource's Base Point in response to a change (up or down) in ERCOT System frequency to maintain the target ERCOT System frequency within predetermined limits according to the Operating Guides.

(4) These requirements also apply to the deployment or recall of a deployment of Reg-Up and Reg-Down:

(a) Deployment or recall of a deployment must be accomplished through use of an automatic signal from ERCOT to each QSE provider of Reg-Up and Reg-Down.

(b) ERCOT shall minimize Reg-Up and Reg-Down energy as much as practicable in each SCED cycle.

(c) ERCOT shall settle energy provided by Reg-Up and Reg-Down at the Resource's Settlement Point Price.

(d) ERCOT shall integrate the control signal sent to providers of Reg-Up and shall calculate the amount of energy deployed by Reg-Up in each Settlement Interval.

(e) ERCOT shall integrate the control signal sent to providers of Reg-Down and shall calculate the amount of energy deployed by Reg-Down in each Settlement Interval.

(f) ERCOT shall calculate for each LFC cycle the amount of regulation that each Resource is expected to provide at that instant in time. The expected amount must be averaged over each SCED interval. The actual generation from telemetry must also be averaged over each SCED interval.

(5) Every day, ERCOT shall post to the MIS Secure Area the total amount of deployed Reg-Up and Reg-Down energy in each Settlement Interval of the previous day.

(6) For each Resource providing Reg-Up or Reg-Down, the implied ramp rate in MW per minute is the total amount of Regulation Service awarded divided by five.

(7) Each QSE providing Reg-Up or Reg-Down and ERCOT shall meet the deployment performance requirements specified in Section 8, Performance Monitoring.

(8) ERCOT shall issue Reg-Up and Reg-Down deployment Dispatch Instructions over ICCP. Those Dispatch Instructions must contain the change in MW output requested of the QSE assuming all Resources are at their Updated Desired Base Point issued by LFC.

[NPRR1010: Replace paragraph (8) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(8) ERCOT shall issue Reg-Up and Reg-Down deployment Dispatch Instructions over ICCP. Those Dispatch Instructions must contain the change in MW output requested of the Resource.

(9) Reg-Up and Reg-Down Dispatch Instructions shall be included as a component of a Resource's UDSP.

(10) Upon the receipt of new Base Points and Ancillary Service awards from SCED, LFC will reset Regulation Service instructions to zero.

6.5.7.6.2.2 Deployment of Responsive Reserve (RRS)

(1) RRS is intended to:

(a) Help restore the frequency within the first few seconds of a significant frequency deviation of the interconnected transmission system;

(b) Provide energy during the implementation of an EEA; and

(c) Provide backup Reg-Up.

(2) ERCOT shall deploy RRS to meet NERC Control Performance Standards and other performance criteria as specified in these Protocols and the Operating Guides, by one or more of the following:

(a) RRS energy deployment by automatic Governor response as a result of frequency deviation;

(b) Through use of an automatic Dispatch Instruction signal to deploy RRS capacity from Generation Resources providing Primary Frequency Response or Controllable Load Resources providing Primary Frequency Response;

(c) By Dispatch Instructions for deployment of RRS energy from a Load Resource, excluding Controllable Load Resources, by an electronic Messaging System; and

(d) RRS energy deployment by automatic action of high-set under-frequency relays as a result of a significant frequency deviation.

(3) ERCOT shall deploy RRS to respond to a frequency deviation when the power requirement to restore frequency to normal ACE in ten minutes exceeds the Reg-Up ramping capability. Deployment of RRS on Load Resources, excluding Controllable Load Resources, must be as described in Section 6.5.9.4, Energy Emergency Alert.

(4) ERCOT may deploy RRS in response to system disturbance requirements as specified in the Operating Guides if no additional energy is available to be dispatched from SCED as determined by the Ancillary Service Capacity Monitor.

(5) Energy from RRS Resources may also be deployed by ERCOT under Section 6.5.9, Emergency Operations.

(6) ERCOT shall allocate the deployment of RRS proportionally among QSEs that provide RRS using Resources that are not on high-set under-frequency relays.

(7) ERCOT shall use the SCED and Non-Spin as soon as practicable to minimize the prolonged use of RRS energy.

(8) Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS. However, except in an Emergency Condition, the QSE's obligation to deliver RRS may not exceed the period for which the service was committed.

(9) Following the deployment or recall of a deployment by Dispatch Instruction of RRS, QSE shall adjust the telemetered RRS Ancillary Service Schedule of Resources providing the service and ERCOT shall adjust the HASL and LASL based on the QSE's telemetered Ancillary Service Schedule for RRS as described in Section 6.5.7.2, Resource Limit Calculator, to account for such deployment.

(10) QSEs providing RRS and ERCOT shall meet the deployment performance requirements specified in Section 8, Performance Monitoring.

(11) ERCOT shall issue RRS deployment Dispatch Instructions over ICCP for Generation Resources and Controllable Load Resources and Extensible Markup Language (XML) for all other Load Resources. Those Dispatch Instructions must contain the MW output requested. For Generation Resources and Controllable Load Resources from which RRS capacity was deployed, ERCOT shall use SCED to dispatch RRS energy. The Base Points for those Resources includes RRS energy as well as any other energy dispatched by SCED.

(12) To the extent that ERCOT deploys a Load Resource that is not a Controllable Load Resource and that has chosen a block deployment option, ERCOT shall either deploy the entire responsibility or, if only partial deployment is possible, skip the Load Resource with the block deployment option and proceed to deploy the next available Resource.

(13) RRS provided from a Generation Resource shall be responsive to frequency deviations as defined in Section 8.5.1.1, Governor in Service. Generation Resources providing RRS must have a Governor droop setting that is not greater than 5.0%.

(14) RRS provided from a Resource capable of FFR shall self-deploy their obligated response within 15 cycles after frequency drops below 59.85 Hz and must continue to provide a response until the frequency increases above that level. Resources which require recharging may do so once the frequency increases above 59.990 Hz.

(15) RRS provided by interruptible Load shall have automatic under-frequency relay setting set at no lower than 59.70 Hz

(16) ERCOT shall deploy RRS to meet NERC Control Performance Standards and other performance criteria as specified in these Protocols and the Operating Guides by one or more of the following:

(a) RRS energy deployment during an EEA;

(b) By Dispatch Instructions for deployment of RRS energy from a Load Resource, excluding Controllable Load Resources, by an electronic Messaging System; and

(c) RRS energy deployment from Load Resources and Generation Resources operating in synchronous condenser fast-response mode by automatic action of high-set under-frequency relays as a result of a significant frequency deviation.

[NPRR863 and NPRR1010: Replace applicable portions of Section 6.5.7.6.2.2 above with the following upon system implementation for NPRR863; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.6.2.2 Deployment of Responsive Reserve (RRS)

(1) RRS is intended to:

(a) Help restore the frequency within the first few seconds of a significant frequency deviation of the interconnected transmission system; and

(b) Provide energy during the implementation of an EEA.

(2) ERCOT shall deploy RRS to meet NERC Control Performance Standards and other performance criteria as specified in these Protocols and the Operating Guides, by one or more of the following:

(a) RRS energy deployment by automatic Governor response as a result of frequency deviation;

(b) By Dispatch Instruction for deployment of RRS energy from a Load Resource, excluding Controllable Load Resources, by an electronic Messaging System;

(c) RRS energy deployment by automatic action of high-set under-frequency relays as a result of a significant frequency deviation; and

(d) By Dispatch Instruction for deployment of RRS from Resources with a Resource Status of ONSC or Resources providing FFR.

(3) ERCOT shall deploy RRS to respond to a frequency deviation when the power requirement to restore frequency to normal ACE in ten minutes exceeds the Reg-Up

ramping capability. Deployment of RRS on Load Resources, excluding Controllable Load Resources, must be as described in Section 6.5.9.4, Energy Emergency Alert.

(4) Energy from RRS Resources may also be deployed by ERCOT under Section 6.5.9, Emergency Operations.

(5) For Resources providing RRS with a Resource Status of ONSC, ERCOT shall deploy RRS as described in Section 6.5.9.4.2, EEA Levels, and Nodal Operating Guide Section 2.3.1.2, Additional Operational Details for Responsive Reserve Providers.

(6) For Resources providing RRS with FFR, ERCOT may manually deploy the FFR RRS in an attempt to recover frequency to meet NERC Performance Control Standards after utilizing Reg-Up and the SCED process which includes off-cycle SCED executions.

(7) ERCOT shall use the SCED, ECRS, and Non-Spin as soon as practicable to minimize the prolonged use of RRS energy.

(8) Once RRS is manually deployed on Load Resources controlled by under-frequency relays or Resources telemetering a Resource Status of ONSC, the Resource's obligation to deliver RRS remains in effect until recalled by ERCOT.

(9) Resources providing RRS and ERCOT shall meet the deployment performance requirements specified in Section 8, Performance Monitoring.

(10) ERCOT shall issue RRS deployment Dispatch Instructions over ICCP for Generation Resources awarded RRS with a Resource Status of ONSC, and SCED-dispatchable Resources providing FFR. Dispatch Instructions must contain the MW output requested. UDSPs for those Resources includes RRS energy deployments as well as any other energy dispatched by SCED.

(11) ERCOT shall issue RRS deployment Dispatch Instructions, specifying the required MW output, through Extensible Markup Language (XML) for non-Controllable Load Resources.

(12) To the extent that ERCOT deploys a Load Resource that is not a Controllable Load Resource and that has chosen a block deployment option, ERCOT shall either deploy the entire award or, if only partial deployment is needed, skip the Load Resource with the block deployment option and proceed to deploy the next available Resource.

(13) RRS provided from a Generation Resource shall be responsive to frequency deviations as defined in Section 8.5.1.1, Governor in Service. Generation Resources providing RRS must have a Governor droop setting that is not greater than 5.0%.

(14) RRS provided from a Resource capable of FFR shall self-deploy their obligated response within 15 cycles after frequency drops below 59.85 Hz and must continue to

provide a response until the frequency increases above that level. Resources which require recharging may do so once the frequency increases above 59.990 Hz.

(15) RRS provided by interruptible Load shall have automatic under-frequency relay setting set at no lower than 59.70 Hz.

(16) ERCOT shall deploy RRS to meet NERC Control Performance Standards and other performance criteria as specified in these Protocols and the Operating Guides by one or more of the following:

(a) RRS energy deployment during an EEA;

(b) By Dispatch Instructions for deployment of RRS energy from a Load Resource, excluding Controllable Load Resources, by an electronic Messaging System; and

(c) RRS energy deployment from Load Resources and Generation Resources operating in synchronous condenser fast-response mode by automatic action of high-set under-frequency relays as a result of a significant frequency deviation.

6.5.7.6.2.3 Non-Spinning Reserve Service Deployment

(1) ERCOT shall deploy Non-Spin Service by operator Dispatch Instruction for the portion of On-Line Generation Resources that is only available through power augmentation and participating as Off-Line Non-Spin, Off-Line Generation Resources and Load Resources. ERCOT shall develop a procedure approved by TAC to deploy Resources providing Non-Spin Service. ERCOT Operators shall implement the deployment procedure when a specified threshold(s) in MW of capability available to SCED to increase generation is reached. ERCOT Operators may implement the deployment procedure to recover deployed RRS or when other Emergency Conditions exist. The deployment of Non-Spin must always be 100% of that scheduled on an individual Resource.

(2) Once Non-Spin capacity from Off-Line Generation Resources providing Non-Spin is deployed and the Generation Resources are On-Line, ERCOT shall use SCED to determine the amount of energy to be dispatched from those Resources.

(3) Off-Line Generation Resources providing Non-Spin (OFFNS Resource Status) are required to provide an Energy Offer Curve for use by SCED.

(4) Non-Spin can be provided by Controllable Load Resources that are SCED qualified or by Load Resources that are not Controllable Load Resources but do not have an under-frequency relay or the under-frequency relay is not armed.

(a) A Controllable Load Resource providing Non-Spin shall have an RTM Energy Bid for SCED and shall be capable of being Dispatched to its Non-Spin Ancillary Service Resource Responsibility within 30 minutes of a deployment instruction

for capacity, using the Resource's Normal Ramp Rate curve. An Aggregate Load Resource must comply with all requirements in the document titled "Requirements for Aggregate Load Resource Participation in the ERCOT Markets."

(b) A Load Resource that is not a Controllable Load Resources shall be capable of being Dispatched to its Non-Spin Ancillary Service Resource Responsibility within 30 minutes of a deployment instruction for capacity. Following a deployment instruction, the QSE shall reduce the Non-Spin Ancillary Service Schedule by the amount of the deployment.

(5) ERCOT shall post a list of Off-Line Generation Resources and Load Resources that are not Controllable Load Resources on the MIS Certified Area immediately following the Day-Ahead Reliability Unit Commitment (DRUC) for each QSE with a Load Resource Non-Spin award. The list will be broken into groups of approximately 500 MW increments. ERCOT shall develop a process for determining which individual Resource to place in each group based on a random sampling of individual Load Resources that are not Controllable Load Resources awarded Non-Spin and Generation Resources carrying Off-Line Non-Spin. At ERCOT's discretion, ERCOT may deploy all groups as specified in the Other Binding Document titled "Non-Spinning Reserve Deployment and Recall Procedure."

(a) On-Line Generation Resources participating in Off-Line Non-Spin using power augmentation will be randomly distributed in Real-Time among the groups created in the Day-Ahead for the purpose of manual deployment of Non-Spin by operator Dispatch Instruction.

(b) Any Generation Resource providing Off-Line Non-Spin that did not previously receive group assignment will be automatically considered in Group 1. Any Load Resource that is not a Controllable Load Resource providing Non-Spin in Real-Time that did not previously receive group assignment will be automatically considered in Group 1. ERCOT may assign a Generation Resource providing Off-Line Non-Spin or a Load Resource that is not a Controllable Load Resource to another group if that Resource did not previously receive group assignment and, in ERCOT's reasonable judgment, Group 1 is too large.

(6) Subject to the exceptions described in paragraphs (a) and (b) below, On-Line Generation Resources that are assigned Non-Spin Ancillary Service Resource Responsibility during an Operating Hour shall always be deployed in that Operating Hour. This deployment shall be considered as a standing Protocol-directed Non-Spin deployment Dispatch Instruction. Within the 30-second window prior to the top-of-hour clock interval described in paragraph (2) of Section 6.3.2, Activities for Real-Time Operations, the QSE shall respond to the standing Non-Spin deployment Dispatch Instruction for those Generation Resources assigned Non-Spin Ancillary Service Resource Responsibility effective at the top-of-hour by adjusting the Non-Spin Ancillary Service Schedule telemetry. The QSE shall set the Non-Spin Ancillary Service Schedule telemetry equal to the portion of Non-Spin being provided from power augmentation if the portion being

provided from power augmentation is participating as Off-Line Non-Spin, otherwise it shall be set to 0. As described in Section 6.5.7.2, Resource Limit Calculator, ERCOT shall adjust the HASL and LASL based on the QSE's telemetered Non-Spin Ancillary Service Schedule to account for such deployment and to make the energy from the full amount of the Non-Spin Ancillary Service Resource Responsibility available to SCED. A Non-Spin deployment Dispatch Instruction from ERCOT is not required and these Generation Resources must be able to Dispatch their Non-Spin Ancillary Service Resource Responsibility in response to a SCED Base Point deployment instruction. The provisions of this paragraph (5) do not apply to:

(a) QSGRs assigned Off-Line Non-Spin Ancillary Service Resource Responsibility and provided to SCED for deployment, which must follow the provisions of Section 3.8.3, Quick Start Generation Resources; or

(b) The portion of On-Line Generation Resources that is only available through power augmentation if participating as Off-Line Non-Spin.

(7) Off-Line Generation Resources providing Non-Spin, while Off-Line and before the receipt of any deployment instruction, shall be capable of being dispatched to their Non-Spin Resource Responsibility within 30 minutes of a deployment instruction. Following a deployment instruction, the QSE shall reduce the Non-Spin Ancillary Service Schedule by the amount of the deployment. An Off-Line Generation Resource providing Non-Spin must also be brought On-Line with an Energy Offer Curve at an output level greater than or equal to P1 multiplied by LSL where P1 is defined in the "ERCOT and QSE Operations Business Practices During the Operating Hour." These actions must be done within a time frame that would allow SCED to fully dispatch the Resource's Non-Spin Resource Responsibility within the 30 minute period using the Resource's Normal Ramp Rate curve. The Resource Status indicating that a Generation 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.

(8) For DSRs providing Non-Spin, on deployment of Non-Spin, the DSR's QSE shall adjust its Resource Output Schedule to reflect the amount of deployment. For non-DSRs with Output Schedules providing Non-Spin, on deployment of Non-Spin, ERCOT shall adjust the Resource Output Schedule for the remainder of the Operating Period to reflect the amount of deployment. ERCOT shall notify the QSEs representing the non-DSR of the adjustment through the MIS Certified Area.

(9) For On-Line Generation Resources providing Non-Spin, Base Points include Non-Spin energy as well as any other energy dispatched as a result of SCED. These Resources' Non-Spin Ancillary Service Resource Responsibility and Normal Ramp Rate curve should allow SCED to fully Dispatch the Resource's Non-Spin Resource Responsibility within the 30-minute time frame according to the Resources' Normal Ramp Rate curve. For the portion of the Non-Spin Ancillary Service Resource Responsibility provided from power augmentation participating as Off-Line, SCED should be able to be dispatch it within 30 minutes of the Non-Spin deployment instruction.

(10) Each QSE providing Non-Spin from a Resource shall inform ERCOT of the Non-Spin Resource availability using the Resource Status and Non-Spin Ancillary Service Resource Responsibility indications for the Operating Hour using telemetry and shall use the COP to inform ERCOT of Non-Spin Resource Status and Non-Spin Ancillary Service Resource Responsibility for hours in the Adjustment Period through the end of the Operating Day.

(11) ERCOT may deploy Non-Spin at any time in a Settlement Interval.

(12) ERCOT's Non-Spin deployment Dispatch Instructions must include:

(a) The Resource name;

(b) A MW level of capacity deployment for Generation Resources with Energy Offer Curve, a MW level of energy for Generation Resources with Output Schedules, and a Dispatch Instruction for Load Resources equal to their awarded Non-Spin Ancillary Service Resource Responsibility; and

(c) The anticipated duration of deployment.

(13) ERCOT shall provide a signal via ICCP to the QSE of a deployed Generation or Load Resource indicating that its Non-Spin capacity has been deployed.

(14) ERCOT shall, as part of its TAC-approved Non-Spin deployment procedure, provide for the recall of Non-Spin energy including descriptions of changes to Output Schedules and release of energy obligations from On-Line Resources with Output Schedules and from On-Line Resources that were previously Off-Line Resources providing Non-Spin capacity.

(15) ERCOT shall provide a notification to all QSEs via the ERCOT website when any Non-Spin capacity is deployed on the ERCOT System showing the time, MW quantity and the anticipated duration of the deployment.

[NPRR863, NPRR1000, NPRR1010, and NPRR1131: Replace applicable portions of Section 6.5.7.6.2.3 above with the following upon system implementation for NPRR863, NPRR1000, or NPRR1131; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.6.2.3 Non-Spinning Reserve Service Deployment

(1) ERCOT shall deploy Non-Spin Service by operator Dispatch Instruction for the portion of On-Line Generation Resources that is only available through power augmentation and participating as Off-Line Non-Spin and Off-Line Generation Resources. ERCOT shall develop a procedure approved by TAC to deploy Resources providing Non-Spin Service. ERCOT Operators shall implement the deployment procedure when a specified threshold(s) in MW of capability available to SCED to increase generation is reached. ERCOT Operators may implement the deployment

procedure to recover deployed RRS, ECRS, or when other Emergency Conditions exist. The deployment of Non-Spin must always be 100% of that awarded on an individual Resource.

(2) Once Non-Spin capacity from Off-Line Generation Resources awarded Non-Spin is deployed and the Generation Resources are On-Line, ERCOT shall use SCED to determine the amount of energy to be dispatched from those Resources.

(3) Off-Line Generation Resources offering to provide Non-Spin must provide an Energy Offer Curve for use by SCED.

(4) Non-Spin can be provided by Controllable Load Resources that are SCED qualified or by Load Resources that are not Controllable Load Resources but do not have an under-frequency relay or the under-frequency relay is unarmed.

(a) Controllable Load Resources awarded Non-Spin shall have an RTM Energy Bid for SCED and shall be capable of being Dispatched to its Non-Spin Ancillary Service award within 30 minutes, using the Resource's Normal Ramp Rate curve. An Aggregate Load Resource must comply with all requirements in the document titled "Requirements for Aggregate Load Resource Participation in the ERCOT Markets."

(b) A Load Resource that is not a Controllable Load Resource shall be capable of being Dispatched to its Non-Spin Ancillary Service Resource Responsibility within 30 minutes of a deployment instruction for capacity.

(5) Off-Line Generation Resources awarded Non-Spin, while Off-Line and before the receipt of any deployment instruction, shall be capable of being dispatched to their Non-Spin award within 30 minutes of a Dispatch Instruction. On-Line Generation Resources awarded Non-Spin on the power augmentation capacity shall be capable of being dispatched to their Non-Spin award within 30 minutes of a Dispatch Instruction.

(6) ERCOT may deploy Non-Spin at any time in a Settlement Interval.

(7) ERCOT shall develop a process to place Off-Line Generation Resources and Load Resources that are not Controllable Load Resources with Non-Spin award in a group based on a random sampling for the purpose of deploying these Resources manually. At ERCOT's discretion, ERCOT may deploy all groups as specified in the Other Binding Document titled "Non-Spinning Reserve Deployment and Recall Procedure."

(a) On-Line Generation Resources participating in Off-Line Non-Spin using power augmentation will be randomly distributed in Real-Time among the groups created in the Day-Ahead for the purpose of manual deployment of Non-Spin by operator Dispatch Instruction.

(b) Any Generation Resource providing Off-Line Non-Spin that did not previously receive group assignment will be automatically considered in Group 1. Any

Load Resource that is not a Controllable Load Resource providing Non-Spin in Real-Time that did not previously receive group assignment will be automatically considered in Group 1. ERCOT may assign a Generation Resource providing Off-Line Non-Spin or a Load Resource that is not a Controllable Load Resource to another group if that Resource did not previously receive group assignment and, in ERCOT's reasonable judgment, Group 1 is too large.

(8) ERCOT's Non-Spin deployment Dispatch Instructions must include:

(a) The Resource name;

(b) A MW level of capacity deployment for Generation Resources with Energy Offer Curve and a MW level of energy for Generation Resources with Output Schedules and a Dispatch Instruction for Load Resources, excluding Controllable Load Resources, at a minimum equal to their awarded Non-Spin Ancillary Service amount; and

(c) The anticipated duration of deployment.

(9) ERCOT shall provide a signal via ICCP to the QSE of a deployed Generation or Load Resource indicating that its Non-Spin capacity has been deployed.

(10) ERCOT shall, as part of its TAC-approved Non-Spin deployment procedure, provide for the recall of Non-Spin from On-Line Resources that were previously Off-Line Resources providing Non-Spin capacity and from On-Line Resources providing Non-Spin through power augmentation.

(11) ERCOT shall provide a notification to all QSEs via the ERCOT website when any Non-Spin capacity is deployed on the ERCOT System showing the time, MW quantity and the anticipated duration of the deployment.

[NPRR863, NPRR1010, and NPRR1148: Insert applicable portions of Section 6.5.7.6.2.4 below upon system implementation of NPRR863 for NPRR863 and NPRR1148; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.5.7.6.2.4 Deployment and Recall of ERCOT Contingency Reserve Service

(1) ECRS is intended to:

(a) Help restore the frequency to 60 Hz within ten minutes of a significant frequency deviation;

(b) Provide energy to avoid or during the implementation of an EEA;

(c) Provide backup to Reg-Up; and

(d) Provide energy upon detection of insufficient available capacity for net load ramps.

(2) ERCOT shall deploy ECRS to meet NERC Standards and other performance criteria as specified in these Protocols and the Operating Guides, by one or more of the following:

(a) ERCOT shall issue ECRS deployment Dispatch Instructions, specifying the required MW output, over ICCP for Resources awarded ECRS with a Resource Status of ONSC.

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

(3) Energy from Resources providing ECRS may also be manually deployed by ERCOT pursuant to Section 6.5.9, Emergency Operations.

(4) ERCOT shall use SCED and Non-Spin as soon as practicable to recover ECRS reserves.

(5) Following a manual ECRS deployment to Load Resources, excluding Controllable Load Resources, or Resources telemetering a Resource Status of ONSC, the QSE's obligation to deliver ECRS remains in effect until ERCOT issues a recall instruction.

(6) For Generation Resources and Controllable Load Resources providing ECRS, Base Points include ECRS energy as well as any other energy dispatched by SCED. A Resource must be able to be fully dispatched by SCED to its ECRS Ancillary Service award within the ten-minute time frame according to its telemetered ramp rate that reflects the Resource's capability of providing ECRS.

(7) Each Resource providing ECRS shall meet the deployment performance requirements specified in Section 8.1.1.4.2, Responsive Reserve Energy Deployment Criteria.

(8) ERCOT shall issue deployment instructions for Load Resources providing ECRS via XML. Such instructions shall contain the MW requested.

(9) To the extent that ERCOT deploys a Load Resource that is not a Controllable Load Resource and that has chosen a block deployment option, ERCOT shall either deploy the entire Ancillary Service award or, if only partial deployment is possible, skip the Load Resource with the block deployment option and proceed to deploy the next available Resource.

(10) ERCOT shall recall deployed ECRS capacity provided from Resource telemetering Resource Status of ONSC once system frequency recovers above 59.98 Hz.

(11) ERCOT shall recall ECRS deployment provided from Load Resource that is not a Controllable Load Resource once PRC is above a pre-defined threshold, as described in the Operating Guides.

6.5.7.7 Voltage Support Service

(1) ERCOT shall coordinate with TSPs the creation and maintenance of Voltage Profiles as described in Section 3.15, Voltage Support.

(2) ERCOT shall instruct the interconnecting TSP, or the TSP's agent, to make Voltage Set Point adjustments, as necessary, within the Generation Resource's Unit Reactive Limit (URL) provided to ERCOT. The interconnecting TSP, or the TSP's agent, shall instruct any QSE or Resource Entity representing a Generation Resource to make the Voltage Set Point adjustments instructed by ERCOT, or as the TSP determines to be necessary. If ERCOT determines that a Generation Resource should be instructed to provide additional MVAr beyond its URL or that a Generation Resource's real power output should be decreased to allow the Generation Resource to provide additional Reactive Power beyond the URL, ERCOT shall issue a Resource-specific Dispatch Instruction requiring any change in Reactive Power and/or real power output, except that ERCOT may not require a Generation Resource to exceed its excitation limits.

[NPRR989: Replace paragraph (2) above with the following upon system implementation:]

(2) ERCOT shall instruct the interconnecting TSP, or the TSP's agent, to make Voltage Set Point adjustments, as necessary, within the Generation Resource's or ESR's Corrected Unit Reactive Limit (CURL) provided to ERCOT. The interconnecting TSP, or the TSP's agent, shall instruct any QSE or Resource Entity representing a Generation Resource or ESR to make the Voltage Set Point adjustments instructed by ERCOT, or as the TSP determines to be necessary. If ERCOT determines that a Generation Resource or ESR should be instructed to provide additional MVAr beyond its URL or that a Generation Resource's or ESR's real power output should be decreased to allow the Generation Resource or ESR to provide additional Reactive Power beyond the URL, ERCOT shall issue a Resource-specific Dispatch Instruction requiring any change in Reactive Power and/or real power output, except that ERCOT may not require a Generation Resource or ESR to exceed its operational limits.

(3) ERCOT and TSPs shall develop procedures for the operation of transmission-controlled reactive Resources in order to minimize the dependence on generation-supplied reactive Resources. For Generation Resources required to provide Voltage Support Service (VSS), GSU transformer tap settings must be managed to maximize the use of the ERCOT System for all Market Participants while maintaining adequate reliability.

[NPRR989: Replace paragraph (3) above with the following upon system implementation:]

(3) ERCOT and TSPs shall develop procedures for the operation of transmission-controlled reactive equipment in order to minimize the dependence on Reactive Power supplied by Generation Resources and ESRs. For Generation Resources and ESRs required to provide Voltage Support Service (VSS), GSU transformer tap settings must be managed to maximize the use of the ERCOT System for all Market Participants while maintaining adequate reliability.

(4) Each TSP, under ERCOT's direction, is responsible for monitoring and ensuring that all Generation Resources required to provide VSS have their dynamic reactive capability deployed in approximate proportion to their respective capability requirements.

[NPRR989: Replace paragraph (4) above with the following upon system implementation:]

(4) Each TSP, under ERCOT's direction, is responsible for monitoring and ensuring that all Generation Resources and ESRs required to provide VSS have their dynamic reactive capability deployed in approximate proportion to their respective capability requirements.

(5) Each Generation Resource required to provide VSS shall follow its Voltage Set Point as directed by ERCOT, the interconnecting TSP, or the TSP's agent, within the operating Reactive Power capability of the Generation Resource.

[NPRR989: Replace paragraph (5) above with the following upon system implementation:]

(5) Each Generation Resource and ESR required to provide VSS shall follow its Voltage Set Point as directed by ERCOT, the interconnecting TSP, or the TSP's agent, within the operating Reactive Power capability of the Generation Resource or ESR.

(6) Each interconnecting TSP, or the TSP's agent, shall telemeter via ICCP the Real-Time Voltage Set Point to ERCOT at the Point of Interconnection Bus (POIB) for each Generation Resource interconnected to the TSP's system required to provide VSS. Each interconnecting TSP, or the TSP's agent shall modify the telemetered Voltage Set Point to match any verbal Voltage Set Point instructions as soon as practicable. ERCOT shall telemeter the Real-Time desired Voltage Set Point and the TSP-designated POIB kV measurement via ICCP to each QSE representing a Generation Resource. Each QSE representing a Generation Resource shall provide in Real-Time the desired Voltage Set Point and the associated POIB kV measurement provided by ERCOT to the Resource Entity for that Generation Resource.

[NPRR989: Replace paragraph (6) above with the following upon system implementation:]

(6) Each interconnecting TSP, or the TSP's agent, shall telemeter via ICCP the Real-Time Voltage Set Point to ERCOT at the Point of Interconnection Bus (POIB) for each Generation Resource and ESRs interconnected to the TSP's system required to provide VSS. Each interconnecting TSP, or the TSP's agent shall modify the telemetered Voltage Set Point to match any verbal Voltage Set Point instructions as soon as practicable. ERCOT shall telemeter the Real-Time desired Voltage Set Point and the TSP-designated POIB kV measurement via ICCP to each QSE representing a Generation Resource or an ESR. Each QSE representing a Generation Resource or an ESR shall provide in Real-Time the desired Voltage Set Point and the associated POIB kV measurement provided by ERCOT to the Resource Entity for that Generation Resource or ESR.

6.5.7.8 Dispatch Procedures

(1) ERCOT shall issue all Resource Dispatch Instructions to the QSE that represents the affected Resource. ERCOT and QSEs are responsible for complying with Dispatch Instructions as prescribed in the Nodal Operating Guides. A QSE may provide a Resource Status of ONTEST for a Generation Resource not providing Ancillary Services to indicate that the Resource is currently undergoing unit testing and is blocked from SCED Dispatch. A QSE may provide a Resource Status of STARTUP for a Generation Resource not providing Ancillary Services to indicate that the Resource is currently undergoing a start-up sequence which requires manual control below or above its telemetered LSL to stabilize the Resource prior to its availability for SCED Dispatch. Generation Resources with a Resource Status of ONTEST will be provided a Base Point equal to the net real power telemetry at the time of the SCED execution. ERCOT may not issue Dispatch Instructions to the QSE for Generation Resources with a Resource Status of ONTEST except:

(a) For Dispatch Instructions that are a part of testing; or

(b) During conditions when the Resource is the only alternative for solving a transmission constraint; or

(c) During Force Majeure Events that threaten the reliability of the ERCOT System.

(2) Each QSE shall immediately forward any valid Dispatch Instruction to the appropriate Resource or group of Resources or identify a reason for non-compliance with the Dispatch Instruction to ERCOT in accordance with Section 6.5.7.9, Compliance with Dispatch Instructions.

(3) If ERCOT believes that a Resource has inadequately responded to a Dispatch Instruction, ERCOT shall notify the QSE representing the Resource as soon as practicable.

(4) ERCOT shall record all voice conversations that occur in the communication of Verbal Dispatch Instructions (VDIs).

(5) By mutual agreement of the TSP and ERCOT, Dispatch Instructions to the TSP may be provided to the TSP's TO. In that case, issuance of the Dispatch Instruction to the TO is considered issuance to the TSP, and the TSP must comply with the Dispatch Instruction exactly as if it had been issued directly to the TSP, whether or not the TO accurately conveys the Dispatch Instruction to the TSP.

[NPRR857: Replace paragraph (5) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(5) By mutual agreement of the TSP, DCTO, and ERCOT, Dispatch Instructions to the TSP or DCTO may be provided to the TSP's or DCTO's Transmission Operator (TO). In that case, issuance of the Dispatch Instruction to the TO is considered issuance to the TSP or DCTO, and the TSP or DCTO must comply with the Dispatch Instruction exactly as if it had been issued directly to the TSP or DCTO, whether or not the TO accurately conveys the Dispatch Instruction to the TSP or DCTO.

(6) ERCOT shall direct VDIs to the Master QSE of a Generation Resource that has been split to function as two or more Split Generation Resources as deemed necessary by ERCOT to effectuate actions for the total Generation Resource for instances in which electronic instructions are not feasible.

6.5.7.9 Compliance with Dispatch Instructions

(1) Except as otherwise specified in this Section, each TSP and each QSE shall comply fully and promptly with a Dispatch Instruction issued to it, unless in the sole and reasonable judgment of the TSP or QSE, such compliance would create an undue threat to safety, undue risk of bodily harm or undue damage to equipment, or the Dispatch Instruction is otherwise not in compliance with these Protocols.

[NPRR857: Replace paragraph (1) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the

interconnection; and (b) The financial security required to fund the interconnection facilities:]

(1) Except as otherwise specified in this Section, each TSP, DCTO, and QSE shall comply fully and promptly with a Dispatch Instruction issued to it, unless in the sole and reasonable judgment of the TSP, DCTO, or QSE, such compliance would create an undue threat to safety, undue risk of bodily harm or undue damage to equipment, or the Dispatch Instruction is otherwise not in compliance with these Protocols.

(2) If the recipient of a Dispatch Instruction does not comply because in the sole and reasonable judgment of the TSP or QSE, such compliance would create an undue threat to safety, undue risk of bodily harm, or undue damage to equipment, then the TSP or QSE must immediately notify ERCOT and provide the reason for non-compliance.

[NPRR857: Replace paragraph (2) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(2) If the recipient of a Dispatch Instruction does not comply because in the sole and reasonable judgment of the TSP, DCTO, or QSE, such compliance would create an undue threat to safety, undue risk of bodily harm, or undue damage to equipment, then the TSP, DCTO, or QSE must immediately notify ERCOT and provide the reason for non-compliance.

(3) If the recipient of a Dispatch Instruction recognizes that the Dispatch Instruction conflicts with other valid instructions or is invalid, the recipient shall immediately notify ERCOT of the conflict and request resolution. ERCOT shall resolve the conflict by issuing another Dispatch Instruction.

(4) ERCOT's final Dispatch Instruction to a QSE in effect applies for all Protocol-related processes. If the QSE does not comply after receiving the final Dispatch Instruction, the QSE remains liable for failure to meet its obligations under the Protocols and remains liable for any charges resulting from such failure.

(5) ERCOT's final Dispatch Instruction to a TSP in effect applies for all Protocol-related processes. If the TSP does not comply after receiving the final Dispatch Instruction, the TSP remains liable for such failure under these Protocols under the TSP's Agreement with ERCOT.

[NPRR857: Replace paragraph (5) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(5) ERCOT's final Dispatch Instruction to a TSP or DCTO in effect applies for all Protocol-related processes. If the TSP or DCTO does not comply after receiving the final Dispatch Instruction, the TSP or DCTO remains liable for such failure under these Protocols under the TSP's or DCTO's Agreement with ERCOT.

(6) In all cases in which compliance with a Dispatch Instruction is disputed, both ERCOT and the QSE or TSP shall document their communications, agreements, disagreements, and reasons for their actions, to enable resolution of the dispute through the Alternative Dispute Resolution (ADR) process in Section 20, Alternative Dispute Resolution Procedure.

[NPRR857: Replace paragraph (6) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(6) In all cases in which compliance with a Dispatch Instruction is disputed, both ERCOT and the QSE, TSP, or DCTO shall document their communications, agreements, disagreements, and reasons for their actions, to enable resolution of the dispute through the Alternative Dispute Resolution (ADR) process in Section 20, Alternative Dispute Resolution Procedure.

(7) An Intermittent Renewable Resource (IRR) must comply with Dispatch Instructions when receiving a flag signifying that the IRR has received a Base Point below the HDL used by SCED.

[NPRR1111: Replace paragraph (7) above with the following upon system implementation of SCR819:]

(7)	An Intermittent Renewable Resource (IRR) must comply with Dispatch Instructions when receiving a flag signifying that the IRR has received a Base Point below the HDL used by SCED or the IRR has been instructed not to exceed its Base Point.

6.5.7.10 IRR Ramp Rate Limitations

(1) Each IRR that is part of a Standard Generation Interconnection Agreement (SGIA) signed on or after January 1, 2009 shall limit its ramp rate to 20% per minute of its nameplate rating (MWs) as registered with ERCOT when responding to or released from an ERCOT deployment.

(2) The requirement of paragraph (1) above does not apply during a Force Majeure Event or during intervals in which a decremental deployment instruction coincides with a demonstrated decrease in the available IRR.

(3) Each IRR that is part of an SGIA signed on or before December 31, 2008 and that controls power output by means other than turbine stoppage shall limit its ramp rate to 20% per minute of its nameplate rating (MWs) as registered with ERCOT when responding to or released from an ERCOT deployment.

(4) The requirement of paragraph (3) above does not apply during a Force Majeure Event, during intervals in which a decremental deployment instruction coincides with a demonstrated decrease in the available IRR, or during unit start up and shut down mode.

(5) The ramp rate requirement of paragraph (3) above shall not apply to an IRR during a limited compliance transition period if the IRR:

(a) Meets the technical specifications of paragraph (3) above but does not comply with the ramp rate requirement; and

(b) Submitted a compliance plan to ERCOT on or before June 1, 2009 that details the technical limitations leading to non-compliance, a work plan to achieve compliance by a reasonable date, and a ramp rate mitigation plan describing the IRR's best efforts to adhere to the IRR ramp rate limitation during the applicable compliance transition period.

(6) The ramp rate requirement of paragraph (3) above shall not apply to an IRR that:

(a) Does not meet the technical specifications of paragraph (3) above; and

(b) Submitted an operations plan to ERCOT on or before June 1, 2009 describing the IRR's best efforts to adhere to the IRR ramp rate limitation.

(7) IRRs subject to the ramp rate limitations of paragraphs (1) and (3) above are exempt from the requirements of the applicable paragraph upon receipt of a valid Dispatch Instruction

from ERCOT to exceed the applicable ramp rate limitation when necessary to protect ERCOT System reliability.

(8) IRRs that operate under a RAS are exempt from the ramp rate limitations of paragraphs (1) and (3) above when decreasing unit output to avoid RAS activation.

(9) IRRs that meet the requirements of paragraphs (1) and (3) above are compliant with the ramp rate limitation requirements when the number of eligible one-minute intervals with an average ramp rate of 25% or less of nameplate capacity is equal to or greater than 90% of the eligible one-minute intervals in any one of three consecutive months. Intervals where paragraphs (2), (4), (7) or (8) above apply shall be excluded as eligible intervals for this performance metric. ERCOT shall initiate a review process with the IRR where the IRR's score is less than 90%.

[NPRR1029: Insert Section 6.5.7.11 below upon system implementation:]

6.5.7.11 DC-Coupled Resource Ramp Rate Limitations

(1) A DC-Coupled Resource that does not meet any of the conditions in paragraph (1) of Section 3.8.7, DC-Coupled Resources, shall adhere to the ramp rate restrictions established in Section 6.5.7.10, IRR Ramp Rate Limitations.

6.5.8 Verbal Dispatch Instruction Confirmation

(1) Following the issuance of a VDI by ERCOT to a QSE for a Generation Resource, ERCOT will provide the QSE with an electronic confirmation of the VDI for Settlement purposes.

(2) A VDI confirmation shall contain the following information:

(a) Operating Day and time ERCOT issued the VDI;

(b) Identification of the QSE for the Resource(s) subject to the VDI, and instructing authority (including the names of the ERCOT Operator and individual that received the VDI);

(c) Identification of the specific Resource(s) subject to the VDI;

(d) Specific actions required of the Resource(s);

(e) Beginning operating level or state of the Resource(s);

(f) Instructed operating level or state of the Resource(s);

(g) Time at which the Resource(s) was required to initiate actions;

(h) Time by which the Resource(s) was required to complete actions; and

(i) Other information relevant to that Dispatch Instruction.

(3) Following receipt by the QSE of the VDI confirmation issued by ERCOT, the QSE shall provide ERCOT with electronic acknowledgement of the VDI confirmation.

6.5.9 Emergency Operations

(1) ERCOT, based on ERCOT System reliability needs, may issue a Dispatch Instruction requiring a Resource to move to a specific output level ("Emergency Base Point").

(2) A QF may only be ordered Off-Line in the case of an ERCOT-declared Emergency Condition with imminent threat to the reliability of the ERCOT System. ERCOT may only Dispatch a QF below its LSL when ERCOT has declared an Emergency Condition and the QF is the only Resource that can provide the necessary relief.

(3) ERCOT shall honor all Resource operating parameters in Dispatch Instructions under normal conditions and Emergency Conditions. During Emergency Conditions, ERCOT may verbally request QSEs to operate its Resources outside normal operating parameters. If such request is received by a QSE, the QSE shall discuss the request with ERCOT in good faith and may choose to comply with the request.

(4) A QSE may not self-arrange for Ancillary Services procured in response to Emergency Conditions.

6.5.9.1 Emergency and Short Supply Operation

(1) ERCOT is responsible for maintaining reliability in normal and Emergency Conditions. The Operating Guides are intended to ensure that minimum standards for reliability are maintained. Minimum standards for reliability are defined by the Operating Guides and the NERC Reliability Standards and include, but are not limited to:

(a) Minimum operating reserve levels;

(b) Criteria for determining acceptable operation of the frequency control system;

(c) Criteria for determining and maintaining system voltages within acceptable limits;

(d) Criteria for maximum acceptable transmission equipment loading levels; and

(e) Criteria for determining when ERCOT is subject to unacceptable risk of widespread cascading Outages.

(2) ERCOT shall, to the fullest extent practicable, utilize the Day-Ahead process, the Adjustment Period process, and the Real-Time process before ordering Resources to specific output levels with Emergency Base Point instructions. It is anticipated that, with

effective and timely communication, the market-based tools available to ERCOT will avert most threats to the reliability of the ERCOT System. However, these Protocols do not preclude ERCOT from taking any action to preserve the integrity of the ERCOT System.

6.5.9.2 Failure of the SCED Process

(1) When the SCED process is not able to reach a solution, ERCOT shall issue a Watch.

(2) For intervals that the SCED process fails to reach a solution, then the LMPs, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders for the interval for which no solution was reached are equal to the LMPs, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders in the most recently solved interval. For Settlement Intervals that the Real-Time Settlement Point Prices are identified as erroneous and ERCOT sets the SCED intervals as failed in accordance with Section 6.3, Adjustment Period and Real-Time Operations Timeline, then the LMPs, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders for the failed SCED intervals are equal to the LMPs, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders in the most recently solved SCED interval that is not set as failed. ERCOT shall notify the market of the failure by posting on the ERCOT website. For intervals covering the first 15 minutes of SCED process execution following a failure, ERCOT shall set the LMPs, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders equal to the LMPs, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders in the most recently solved SCED interval prior to the SCED process failure. ERCOT shall notify the market of this price correction by posting on the ERCOT website.

[NPRR1010: Replace paragraph (2) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(2) For intervals that the SCED process fails to reach a solution, then the LMPs, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Service for the interval for which no solution was reached are equal to the LMPs, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Service in the most recently solved interval. For Settlement Intervals that the Real-Time Settlement Point Prices are identified as erroneous, and ERCOT sets the SCED intervals as failed in accordance with Section 6.3, Adjustment Period and Real-Time Operations Timeline, then the LMPs, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Service, for the failed SCED

intervals are equal to the LMPs, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Service, in the most recently solved SCED interval that is not set as failed. ERCOT shall notify the market of the failure by posting on the ERCOT website. For intervals covering the first 15 minutes of SCED process execution following a failure, ERCOT shall set the LMPs, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Service, equal to the LMPs, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders for Energy, and Real-Time Reliability Deployment Price Adders for Ancillary Service, in the most recently solved SCED interval prior to the SCED process failure. ERCOT shall notify the market of this price correction by posting on the ERCOT website.

(3) In the event that a Market Suspension is declared in accordance with Section 25, Market Suspension and Restart, upon the effective date and time of the Market Suspension, the Market Suspension Settlement methodology set forth in Section 25.5, Market Suspension and Market Restart Settlement, will supersede the provisions set forth in paragraph (2) above.

(4) Once ERCOT issues a Watch for a SCED process failure, ERCOT may use any of the following measures:

(a) ERCOT may direct the SCED process to relax the active transmission constraints and/or the HASLs and LASLs for specific Resources and resume calculation of LMPs, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders by reducing the Ancillary Service Schedules for the affected Resource, if sufficient supply exists to manage total system needs;

[NPRR1010: Replace paragraph (a) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(a) ERCOT may direct the SCED process to relax the active transmission constraints;

(b) ERCOT may issue Emergency Base Points for Resources;

(c) ERCOT may manually issue Emergency Base Points for a Resource and must communicate the Resource name, MW output requested, and start time and duration of the Dispatch Instruction to the QSE representing the Resource;

(d) ERCOT may issue an instruction to hold the previous interval; and

(e) A QF, a hydro Generation Resource, or a nuclear-powered Resource may be instructed by ERCOT to operate below its LSL only after all other Resource options have been exhausted.

(5) The Watch continues until the SCED process can reach a solution without using the measures in paragraph (4) above.

6.5.9.3 Communication Prior to and During Emergency Conditions

(1) Effective, accurate, and timely communication between ERCOT, TSPs, and QSEs is essential. Each QSE must be provided adequate information to make informed decisions and must receive the information with sufficient advance notice to facilitate Resource and Load responses.

[NPRR857: Replace paragraph (1) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(1) Effective, accurate, and timely communication between ERCOT, TSPs, DCTOs, and QSEs is essential. Each QSE must be provided adequate information to make informed decisions and must receive the information with sufficient advance notice to facilitate Resource and Load responses.

(2) The type of communication ERCOT issues is determined primarily on the basis of the time available for the market to respond before an Emergency Condition occurs. The timing of these communications could range from days in advance to immediate. If there is insufficient time to allow the market to react, ERCOT may bypass one or more of the communication steps.

(3) ERCOT shall consider the severity of the potential Emergency Condition as it determines which of the communications to use as set forth in the following subsections. The severity of the Emergency Condition could be limited to an isolated local area, or the condition might cover large areas affecting several entities, or the condition might be an ERCOT-wide condition potentially affecting the entire ERCOT System.

(4) The following Sections describe the types of communications that will be issued by ERCOT to inform all QSEs and TSPs of the operating situation. These communications may relate to transmission, distribution, or Generation or Load Resources. The communications must specify the severity of the situation, the area affected, the areas potentially affected, and the anticipated duration of the Emergency Condition.

[NPRR857: Replace paragraph (4) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(4) The following Sections describe the types of communications that will be issued by ERCOT to inform all QSEs, TSPs, and DCTOs of the operating situation. These communications may relate to transmission, distribution, or Generation or Load Resources. The communications must specify the severity of the situation, the area affected, the areas potentially affected, and the anticipated duration of the Emergency Condition.

6.5.9.3.1 Operating Condition Notice

(1) ERCOT will issue an Operating Condition Notice (OCN) to inform Market Participants of a possible future need for more Resources due to conditions that could affect ERCOT System reliability. OCNs are for informational purposes only, and ERCOT exercises no additional operational authority with the issuance of this type of notice, but may solicit additional information from QSEs in order to determine whether the issuance of an Advisory, Watch, or Emergency Notice is warranted. The OCN is the first of three levels of communication issued by ERCOT in anticipation of a possible Emergency Condition.

(2) When time permits, ERCOT will issue an OCN before issuing an Advisory, Watch, or Emergency Notice. However, issuance of an OCN may not require action on the part of any Market Participant, but rather serves as a notice to Market Participants that some attention to the changing conditions may be warranted. OCNs serve to communicate to QSEs the need to take extra precautions to be prepared to serve the Load during times when contingencies are most likely to arise.

[NPRR857: Replace paragraph (2) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(2) When time permits, ERCOT will issue an OCN before issuing an Advisory, Watch, or Emergency Notice. However, issuance of an OCN may not require action on the part of any Market Participant, but rather serves as notice to Market Participants that some

attention to the changing conditions may be warranted. OCNs serve to communicate to QSEs the need to take extra precautions to be prepared to serve the Load during times when contingencies are most likely to arise.

(3) Reasons for OCNs include, but are not limited to, unplanned transmission Outages, insufficient Resources to meet forecasted conditions, and weather-related concerns such as anticipated freezing temperatures, hurricanes, wet weather, and ice storms.

(4) ERCOT will monitor actual and forecasted weather for the ERCOT Region and adjacent NERC regions. When adverse weather conditions are expected, ERCOT may confer with TSPs and QSEs regarding the potential for adverse reliability impacts and contingency preparedness. Based on its assessment of the potential for adverse conditions, ERCOT may require information from QSEs representing Resources regarding the Resources' fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request. The specific information that may be requested shall be defined in the Operating Guides. QSEs representing Resources shall provide the requested information in a timely manner, as defined by ERCOT at the time of the request.

[NPRR857: Replace paragraph (4) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(4) ERCOT will monitor actual and forecasted weather for the ERCOT Region and adjacent NERC regions. When adverse weather conditions are expected, ERCOT may confer with TSPs, DCTOs, and QSEs regarding the potential for adverse reliability impacts and contingency preparedness. Based on its assessment of the potential for adverse conditions, ERCOT may require information from QSEs representing Resources regarding the Resources' fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request. The specific information that may be requested shall be defined in the Operating Guides. QSEs representing Resources shall provide the requested information in a timely manner, as defined by ERCOT at the time of the request.

(5) QSEs and TSPs are expected to establish and maintain internal procedures for monitoring actual and forecasted weather and for implementing appropriate measures when the potential for adverse weather or other conditions (which could threaten ERCOT System reliability) arise.

[NPRR857: Replace paragraph (5) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(5) QSEs, TSPs, and DCTOs are expected to establish and maintain internal procedures for monitoring actual and forecasted weather and for implementing appropriate measures when the potential for adverse weather or other conditions (which could threaten ERCOT System reliability) arise.

6.5.9.3.1.1 Advance Action Notice

(1) ERCOT may issue an AAN in anticipation of a possible Emergency Condition. Any AAN will identify actions ERCOT expects to take to address the possible Emergency Condition unless the need for ERCOT action is alleviated by QSE and/or TSP actions taken, or by other system developments that occur, before a time stated in the AAN.

(2) An AAN may not require action on the part of any Market Participant but may include additional information so that Market Participants can modify their plans in such a way that mitigates the need for ERCOT to take additional actions.

(3) An AAN will be canceled if ERCOT determines that the possible Emergency Condition has been alleviated by QSE or TSP action, by ERCOT action, or by other system developments.

6.5.9.3.2 Advisory

(1) An Advisory is the second of three levels of communication issued by ERCOT in anticipation of a possible Emergency Condition.

(2) ERCOT shall issue an Advisory for reasons such as, but not limited to, the following:

(a) When it recognizes that conditions are developing or have changed and more Ancillary Services will be needed to maintain current or near-term operating reliability;

(b) When weather or ERCOT System conditions require more lead-time than the normal DAM allows;

(c) When communications or other controls are significantly limited; or

(d) When ERCOT Transmission Grid conditions are such that operations within security criteria as defined in the Operating Guides are not likely or possible because of Forced Outages or other conditions unless a Constraint Management Plan (CMP) exists.

(3) The Advisory must communicate existing constraints. ERCOT shall notify TSPs and QSEs of the Advisory, and QSEs shall notify appropriate Resources and Load Serving Entities (LSEs). ERCOT shall communicate with TSPs as needed to confirm their understanding of the condition and to determine the availability of Transmission Facilities. For the purposes of verifying submitted information, ERCOT may communicate with QSEs.

[NPRR857: Replace paragraph (3) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(3) The Advisory must communicate existing constraints. ERCOT shall notify TSPs, DCTOs, and QSEs of the Advisory, and QSEs shall notify appropriate Resources and Load Serving Entities (LSEs). ERCOT shall communicate with TSPs and DCTOs as needed to confirm their understanding of the condition and to determine the availability of Transmission Facilities. For the purposes of verifying submitted information, ERCOT may communicate with QSEs.

(4) Although an Advisory is for information purposes, ERCOT may exercise its authority, in such circumstances, to increase Ancillary Service requirements above the quantities originally specified in the Day-Ahead in accordance with procedures. ERCOT may require information from QSEs representing Resources regarding the Resources' fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request. The specific information that may be requested shall be defined in the Operating Guide. QSEs representing Resources shall provide the requested information in a timely manner, as defined by ERCOT at the time of the request.

(5) When an Advisory is issued for PRC below 3,000 MW and ERCOT expects system conditions to deteriorate to the extent that an EEA Level 2 or 3 may be experienced, ERCOT shall evaluate constraints active in SCED and determine which constraints have the potential to limit generation output.

(a) Upon identification of such constraints, ERCOT shall coordinate with the TSPs that own or operate the overloaded Transmission Facilities associated with those

constraints, as well as the Resource Entities whose generation output may be limited, to determine whether:

[NPRR857: Replace paragraph (a) above with the following upon system implementation and satisfying the following conditions: (1) Southern Cross provides ERCOT with funds to cover the entire estimated cost of the project; and (2) Southern Cross has signed an interconnection agreement with a TSP and the TSP gives ERCOT written notice that Southern Cross has provided it with: (a) Notice to proceed with the construction of the interconnection; and (b) The financial security required to fund the interconnection facilities:]

(a) Upon identification of such constraints, ERCOT shall coordinate with the TSPs and DCTOs that own or operate the overloaded Transmission Facilities associated with those constraints, as well as the Resource Entities whose generation output may be limited, to determine whether:

(i) A 15-Minute Rating is available to allow for additional transmission capacity for use in congestion management, if an EEA Level 2 or 3 is declared, and post-contingency actions can be taken within 15 minutes to return the flow to within the Emergency Rating. Such actions may include, but are not limited to, reducing the generation that increased output as a result of enforcing the 15-Minute Rating rather than the Emergency Rating;

(ii) Post-contingency loading of the Transmission Facilities is expected to be at or below Normal Rating within two hours; or

(iii) Additional transmission capacity could allow for additional output from a limited Generation Resource by taking one of the following actions:

(A) Restoring Transmission Elements that are out of service;

(B) Reconfiguring the transmission system; or

(C) Making adjustments to phase angle regulator tap positions.

If ERCOT determines that one of the above-mentioned actions allows for additional output from a limited Generation Resource, ERCOT may instruct the TSPs to take the action(s) during the Advisory to allow for additional output from the limited Generation Resource.

(b) ERCOT shall also coordinate with TSPs who own and operate the Transmission Facilities associated with the double-circuit contingencies for the constraints identified above to determine whether the double-circuit failures are at a high risk of occurring due to system conditions, which may include: severe weather conditions forecasted by ERCOT in the vicinity of the double circuit, weather

conditions that indicate a high risk of insulator flashover on the double circuit, repeated Forced Outages of the individual circuits that are part of the double circuit in the preceding 48 hours, or fire in progress in the right of way of the double circuit.

(c) The actions detailed in this Section shall be supplemental to the development and maintenance of CMPs as otherwise directed by the Protocols or Operating Guides.

6.5.9.3.3 Watch

(1) A Watch is the third of three levels of communication issued by ERCOT in anticipation of a possible Emergency Condition.

(2) ERCOT shall issue a Watch when ERCOT determines that:

(a) Conditions have developed such that additional Ancillary Services are needed in the current Operating Period;

(b) There are insufficient Ancillary Services or Energy Offers in the DAM;

[NPRR1010: Delete paragraphs (a) and (b) above upon system implementation of the Real-Time Co-Optimization (RTC) project and renumber accordingly.]

(c) Market-based congestion management techniques embedded in SCED as specified in these Protocols will not be adequate to resolve transmission security violations;

(d) Forced Outages or other abnormal operating conditions have occurred, or may occur that require operations with active violations of security criteria as defined in the Operating Guides unless a CMP exists;

(e) ERCOT varies from timing requirements or omits one or more Day-Ahead or Adjustment Period and Real-Time procedures;

(f) ERCOT varies from timing requirements or omits one or more scheduling procedures in the Real-Time process; or

(g) The SCED process fails to reach a solution, whether or not ERCOT is using one of the measures specified in paragraph (4) of Section 6.5.9.2, Failure of the SCED Process.

(3) With the issuance of a Watch pursuant to paragraph (2)(a) above, ERCOT may exercise its authority to immediately procure the following services from existing offers:

(a) Regulation Services;