	SCED-dispatchable ECRS not from DGRs and DESRs on a Load shed circuit	Yes	No	No
	SCED-dispatchable ECRS from DGRs and DESRs on a Load shed circuit	Yes	Yes	No
	Manually dispatched ECRS	Yes	No	Yes

(7) The table below shows the RRS trades that are allowed for each type of original responsibility:

	Allowable RRS Ancillary Service Trades		
Original Responsibility	**Resource providing Primary Frequency Response**	**Resource providing FFR triggered at 59.85 Hz**	**Load Resource triggered at 59.7 Hz**
Resource providing Primary Frequency Response	Yes	No	No
Resource providing FFR triggered at 59.85 Hz	Yes	Yes	Yes
Load Resource triggered at 59.7 Hz	Yes	No	Yes

(8) The table below shows the Non-Spin trades that are allowed for each type of original responsibility:

	Allowable Non-Spin Ancillary Service Trades

Original Responsibility	Generation Resource or Controllable Load Resource	Load Resource other than a Controllable Load Resource
Generation Resource or Controllable Load Resource	Yes	No
Load Resource other than a Controllable Load Resource	Yes	Yes

[NPRR1213: Replace paragraph (8) above with the following upon system implementation, and upon system implementation of NPRR1171:]

(6) The table below shows the Non-Spin trades that are allowed for each type of original responsibility:

	Allowable Non-Spin Ancillary Service Trades		
Original Responsibility	**Generation Resource not DGRs and DESRs on a Load shed circuit or Controllable Load Resource**	**DGRs and DESRs on a Load shed circuit**	**Load Resource other than a Controllable Load Resource**
Generation Resource not on circuits subject to Load shed or Controllable Load Resource	Yes	No	No
DGRs and DESRs on a Load shed circuit	Yes	Yes	No
Load Resource other than a Controllable Load Resource	Yes	No	Yes

(9) A QSE with an Ancillary Service Supply Responsibility for Regulation Service may transfer that portion of its Ancillary Service Supply Responsibility via Ancillary Service Trade(s) to another QSE only if that QSE provides the transferred portion with Regulation Service that is not Fast Responding Regulation Service (FRRS). The table below shows the Regulation Service trades that are allowed for each type of original responsibility. The same limitations apply separately to both Reg-Up and Reg-Down:

	Allowable Regulation Ancillary Service Trades	
Original Responsibility	**Regulation Service that is not FRRS**	**FRRS**
Regulation Service that is not FRRS	Yes	No
FRRS	Yes	No

4.4.9.3.3 Energy Offer Curve Cost Caps

(1) The following Energy Offer Curve Cost Caps must be used for the purpose of make-whole Settlements, Real-Time High Dispatch Limit Override Energy Payments, and Voltage Support Service Payments:

(a) Nuclear = $15.00/MWh;

(b) Coal and Lignite = $18.00/MWh;

(c) Combined Cycle greater than 90 MW = 9 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(d) Combined Cycle less than or equal to 90 MW = 10 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(e) Gas - Steam Supercritical Boiler = 10.5 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(f) Gas Steam Reheat Boiler = 11.5 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(g) Gas Steam Non-reheat or boiler without air-preheater = 14.5 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(h) Simple Cycle greater than 90 MW = 14 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(i) Simple Cycle less than or equal to 90 MW = 15 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(j) Reciprocating Engines = 16 MMBtu/MWh * ((Percentage of FIP * FIP) + (Percentage of FOP * FOP))/100, as specified in the Energy Offer Curve;

(k) Hydro = $10.00/MWh;

(l) Other = SWCAP;

[NPRR1008: Replace item (l) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(l) Other = DASWCAP or RTSWCAP;

(m) RMR Resource = SWCAP;

[NPRR1008: Replace item (m) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(m) RMR Resource = effective Value of Lost Load (VOLL);

(n) Wind Generation Resources = $0.00/MWh; ~~and~~

(o) PhotoVoltaic Generation Resource (PVGR) = $0.00/MWh; and

(p) Energy Storage Resource (ESR) = $0.00/MWh.

(2) ERCOT shall produce an annual report each April that provides the amount of DAM and RUC Make-Whole Payments during the previous calendar year for Resources categorized as Other, per item (1)(l) above, as a percentage of the total amount of DAM and RUC Make-Whole Payments made during the previous calendar year. The report shall be based on final Settlements and include the total number of Resources classified as Other. ERCOT shall present this report annually to the appropriate Technical Advisory Committee (TAC) subcommittee. If there are no Make-Whole Payments for Resources categorized as Other for a given calendar year, then ERCOT will not be required to produce the annual report.

(3) Items in paragraphs (1)(c) and (d) above are determined by capacity of largest simple-cycle combustion turbine in the train selected.

(4) The FIP and FOP used to calculate the Energy Offer Curve Cap for Make-Whole Payment calculation purposes shall be the FIP or FOP for the Operating Day. In the

event the Energy Offer Curve Cap for Make-Whole Payment calculation purposes must be calculated before the FIP or FOP is available for the particular Operating Day, the FIP and FOP for the most recent preceding Operating Day shall be used. Once the FIP and FOP are available for a particular Operating Day, those values shall be used in the calculations. If the percentage fuel mix is not specified or if no Energy Offer Curve exists, then the minimum of FIP or FOP shall be used.

[NPRR1216: Insert paragraph (5) below upon system implementation:]

(5) During an Emergency Offer Cap (ECAP) Effective Period, the SWCAP used for purposes of calculating the Energy Offer Curve Cost Caps shall be set to the maximum value of SWCAP that was effective for the Operating Day.

[NPRR1216: Replace paragraph (5) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(5) During an ECAP Effective Period, for purposes of calculating the Energy Offer Curve Cost Caps, the DASWCAP shall be set to the DASWCAP that was used to clear the DAM, and the VOLL shall be set to the maximum value VOLL that was effective for the Operating Day.

6.5.1.1 ERCOT Control Area Authority

(1) ERCOT, as Control Area Operator (CAO), is authorized to perform the following actions for the limited purpose of securely operating the ERCOT Transmission Grid under the standards specified in North American Electric Reliability Corporation (NERC) Standards, the Operating Guides and these Protocols, including:

(a) Direct the physical operation of the ERCOT Transmission Grid, including circuit breakers, switches, voltage control equipment, and Load-shedding equipment;

(b) Dispatch Resources that have committed to provide Ancillary Services;

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

(b) Dispatch Resources that have been awarded Ancillary Services;

(c) Direct changes in the operation of voltage control equipment;

(d) Direct the implementation of Reliability Must-Run (RMR) Service, Remedial Action Plans (RAPs), Automatic Mitigation Plans (AMPs), Remedial Action Schemes (RASs), and transmission switching to prevent the violation of ERCOT Transmission Grid security limits; and

[NPRR1198: Replace paragraph (d) above with the following upon system implementation and renumber accordingly:]

(d) Direct the implementation of Reliability Must-Run (RMR) Service;

(e) Direct the implementation, disabling, or reversal of implementation of Remedial Action Plans (RAPs), Automatic Mitigation Plans (AMPs), Remedial Action Schemes (RASs), Pre-Contingency Action Plans (PCAPs), Extended Action Plans (EAPs), and transmission switching to prevent the violation of ERCOT Transmission Grid security limits; and

(e) Perform additional actions required to prevent an imminent Emergency Condition or to restore the ERCOT Transmission Grid to a secure state in the event of an ERCOT Transmission Grid Emergency Condition.

(2) Unless the ERCOT Protocols or Other Binding Documents explicitly provide otherwise, ERCOT shall not model, monitor, direct operation of, or otherwise exercise any operational authority over any facility that operates on the low voltage side of the distribution transformer except as may be necessary for the following purposes:

(a) To ensure the reliable interconnection, dispatch, operation, and Settlement of any Generation Resource, Energy Storage Resource (ESR), Load Resource, or Emergency Response Service (ERS) Resource that is, or is proposed to be, interconnected at distribution voltage, and to ensure the reliable operation and Settlement of any other ERCOT-registered generator~~ or Energy Storage System (ESS)~~;

(b) To provide ERCOT information about all generators~~ and ESS~~ interconnected at distribution voltage as requested by ERCOT pursuant to these Protocols or Other Binding Documents for the purposes of ensuring accurate Settlement and operating and planning the Transmission Grid; and

(c) To effectuate automatic or manual Load-shedding as prescribed by these Protocols or Other Binding Documents.

(3) Nothing in paragraph (2) above limits ERCOT's authority to require that a Transmission Service Provider (TSP) or Transmission Operator (TO) disconnect any Facility operated at distribution voltage from the ERCOT System if ERCOT determines such action is necessary to address a reliability concern on the ERCOT Transmission Grid. Additionally, nothing in paragraph (2) above limits ERCOT's authority to require appropriate modeling and telemetry of transmission Loads that may represent multiple

distribution-level Loads, as provided in Section 3.10.7.2, Modeling of Resources and Transmission Loads.

(4) Consistent with paragraph (1)(e) above, if ERCOT seeks to exercise its authority to prevent an anticipated Emergency Condition relating to serving Load in the current or next Season by procuring existing capacity that may be used to maintain ERCOT System reliability in a manner not otherwise delineated in these Protocols and the Operating Guides, ERCOT shall take the following actions:

(a) Upon determination by ERCOT that additional capacity is needed to prevent an Emergency Condition and prior to any procurement activity associated with such additional capacity, ERCOT shall issue a Notice as soon as practicable with the following information:

(i) A detailed description of the reliability condition and need for additional capacity as determined by ERCOT and the timing of the proposed procurement;

(ii) Justification for the quantity of additional capacity to be requested;

(iii) Identification of potential Generation Resources, Energy Storage Resources (ESRs), or Load providing capacity considered by ERCOT to be acceptable for providing the additional capacity. Load capacity may be provided by Entities who, at ERCOT's direction, would interrupt consumption of electric power and remain interrupted until released by ERCOT; and

(iv) A schedule of activities associated with the proposed procurement.

(b) If ERCOT identifies a specific Entity with which it will negotiate the terms for procurement of additional capacity, then ERCOT shall issue a Notice as soon as practicable that includes the Entity name and, as applicable, the Resource mnemonic, the Resource MW rating by Season, the name of the Resource Entity, and the potential duration of any contract, including anticipated start and end dates.

(c) ERCOT shall, to the fullest extent practicable, ensure that any actions taken to procure additional capacity meet the following criteria:

(i) Any capacity procured pursuant to this paragraph will be procured using an open process, and the terms of the procurement between ERCOT and the Entity will be memorialized in contracts that will be publicly available for inspection on the ERCOT website.

(ii) Each contract will include specified financial terms and termination dates. For purposes of Settlement, any contract associated with a Generation Resource or ESR will include substantially the same terms and conditions

as an RMR Unit under a RMR Agreement, including the Eligible Cost budgeting process.

(iii) ERCOT shall provide notice to the ERCOT Board, at the next ERCOT Board meeting after ERCOT has signed the contract, that the actions required prior to execution of the contract, pursuant to paragraphs (4)(a) through (c) above, were completed by ERCOT before the contract was executed.

(iv) Any information submitted by the Entity to ERCOT through the procurement process may be designated as Protected Information and treated in accordance with the provisions of Section 1.3, Confidentiality, provided that final contract terms must be made available for public inspection.

(d) A Generation Resource or ESR that has received capital contributions from ERCOT pursuant to a contract executed under this paragraph (4) may not participate in the energy or Ancillary Services markets until such capital contributions have been refunded to ERCOT. For the purposes of this Section, capital contributions are defined as improvements with an asset life greater than one year under the applicable federal tax rules. The Resource Entity's refund of capital contributions shall be a lump sum payment calculated as follows:

(i) If the Generation Resource or ESR chooses to participate in the energy or Ancillary Service markets after the termination date of the contract executed under this paragraph (4), the Qualified Scheduling Entity (QSE) representing the Resource Entity shall repay, in a lump sum payment, 100% of the book value of the capitalized equipment and all installation charges leading to turn key, one-time startup based on a linear depreciation over the estimated life of the capitalized component(s) in accordance with Generally Accepted Accounting Principles (GAAP) standards for electric utility equipment. The estimated life shall be based on documentation provided by the manufacturer; if installing used equipment, the estimated life may be based on an approximation agreed to by the Resource Entity and ERCOT.

(ii) If the Generation Resource or ESR chooses to participate in the energy or Ancillary Services markets as contemplated in item (4)(d)(i) above, and its participation requires a lump sum payment of capital contributions, ERCOT will issue a notice to all registered Market Participants announcing the Generation Resource's or ESR's decision to participate in the market(s) and identifying the amount of the lump sum payment due pursuant to item (4)(d)(i) above. ERCOT will also issue a notice to all registered Market Participants after completion of the collection and disbursement of the capital contributions, as described in item (4)(d)(iii) below, and after resolution of any disputes related to these capital contributions.

(iii) After ERCOT receives a Notification of Change of ~~Generation~~ Resource Designation (Section 22, Attachment H, Notification of Change of ~~Generation~~ Resource Designation) changing the Resource designation to "operational" at a future date, ERCOT shall charge the QSE representing the Resource Entity for capital expenditures incurred and previously paid to the Resource Entity as a result of the Resource's return to service pursuant to this Section.

(A) For months in the contract term where notice is received more than five Business Days prior to True-Up Settlement of the first Operating Day of that month, ERCOT shall claw back any payments made for the capital expenditure associated with that month and subsequent months of the term, on the next practical Settlement but no later than the True-Up Settlement.

(B) For months in the contract term where notice is received five Business Days or less prior to True-Up Settlement of the first Operating Day of that month, ERCOT shall claw back any payments made for the capital expenditures within 45 days of receipt of the notice.

(C) ERCOT shall distribute the repayment to QSEs representing Load on the same basis used to collect the monthly capital expenditures, using a monthly Load Ratio Share (LRS). A QSE's monthly LRS shall be the QSE's total Real-Time Adjusted Metered Load (AML) for the month divided by the total ERCOT Real-Time AML for the same month.

(e) ERCOT shall endeavor to minimize the deployment of capacity procured pursuant to this paragraph with the goal of reducing the potential distortion of markets. Resources and Loads deployed to alleviate imminent Emergency Conditions will not be offered into the Day-Ahead Market (DAM). Rather, ERCOT will determine whether to use the capacity as part of the Hourly Reliability Unit Commitment (HRUC) process based on system conditions and the ability to meet Demand. In the event Generation Resources are committed and On-Line, ERCOT systems will generate a proxy offer for the Generation Resource at the System-Wide Offer Cap (SWCAP). The default offer will place the Generation Resources among the last for economic Dispatch, so as not to displace Generation Resources that are On-Line and offering into the market. To the extent practicable, the capacity deployed to alleviate imminent Emergency Conditions will not be used solely for the purpose of reducing local congestion.

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

(e) ERCOT shall endeavor to minimize the deployment of capacity procured pursuant to this paragraph with the goal of reducing the potential distortion of markets. Resources and Loads deployed to alleviate imminent Emergency Conditions will not be offered into the Day-Ahead Market (DAM). Rather, ERCOT will determine whether to use the capacity as part of the Hourly Reliability Unit Commitment (HRUC) process based on system conditions and the ability to meet Demand. In the event Generation Resources are committed and On-Line, ERCOT systems will generate a proxy offer for the Generation Resource at the Real-Time System-Wide Offer Cap (RTSWCAP). The default offer will place the Generation Resources among the last for economic Dispatch, so as not to displace Generation Resources that are On-Line and offering into the market. To the extent practicable, the capacity deployed to alleviate imminent Emergency Conditions will not be used solely for the purpose of reducing local congestion.

(f) An Entity cannot be compelled to enter into a contract under this paragraph.

6.5.3 Equipment Operating Ratings and Limits

(1) ERCOT shall consider all equipment operating limits when issuing Dispatch Instructions. Except as stated in Section 6.5.9, Emergency Operations, if a Dispatch Instruction conflicts with a restriction that may be placed on equipment from time to time by a TSP, a DSP, or a QSE representing a Generation Resource or ESR~~'s QSE~~ to protect the integrity of equipment, ERCOT shall honor the restriction.

[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) ERCOT shall consider all equipment operating limits when issuing Dispatch Instructions. Except as stated in Section 6.5.9, Emergency Operations, if a Dispatch Instruction conflicts with a restriction that may be placed on equipment from time to time by a TSP, a DSP, a DCTO, or a QSE representing a Generation Resource or ESR~~'s QSE~~ to protect the integrity of equipment, ERCOT shall honor the restriction.

(2) Each TSP shall notify ERCOT of any limitations on the TSP's system that may affect ERCOT Dispatch Instructions. ERCOT shall continuously maintain a posting on the MIS Secure Area of any TSP limitations that may affect Dispatch Instructions. Examples of such limitations may include: temporary changes to transmission or transformer

ratings, temporary changes to range of automatic tap position capabilities on auto-transformers, fixing or blocking tap changer, changes to no-load tap positions or other limitations affecting the delivery of energy across the ERCOT Transmission Grid. Any conflicts that cannot be satisfactorily resolved may be brought to ERCOT by any of the affected Entities for investigation and resolution.

[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) Each TSP or DCTO shall notify ERCOT of any limitations on the TSP's or DCTO's system that may affect ERCOT Dispatch Instructions. ERCOT shall continuously maintain a posting on the MIS Secure Area of any TSP or DCTO limitations that may affect Dispatch Instructions. Examples of such limitations may include: temporary changes to transmission or transformer ratings, temporary changes to range of automatic tap position capabilities on auto-transformers, fixing or blocking tap changer, changes to no-load tap positions or other limitations affecting the delivery of energy across the ERCOT Transmission Grid. Any conflicts that cannot be satisfactorily resolved may be brought to ERCOT by any of the affected Entities for investigation and resolution.

6.5.5.1 Changes in Resource Status

(1) Each QSE shall notify ERCOT via telemetry of a change in Resource Status that is not related to a Forced Outage as soon as practicable but no longer than 15 minutes after the change in status occurs and through changes in the Current Operating Plan (COP) as soon as practicable but no longer than 60 minutes after the change in status of the Resource occurs.

(2) When an On-Line Resource is experiencing an event that may affect its availability and/or capability and that requires further actions to stabilize the Resource and/or determine the impact of the event, the QSE may change the Resource Status to ONHOLD within 15 minutes of experiencing an event. Following this Resource Status change, the telemetered HSL and any other applicable telemetry of the Resource as specified in paragraph (2) of Section 6.5.5.2, Operational Data Requirements, shall be updated as soon as practicable but no longer than 15 minutes after the change in Resource Status to ONHOLD. After the QSE has determined the impact of the event, the QSE shall change the Resource Status to its updated status as soon as practicable but no longer than 60 consecutive minutes of being in the ONHOLD status.

(3) Each QSE shall promptly inform ERCOT when the operating mode of ~~its Generation Resource's~~the Automatic Voltage Regulator (AVR) or Power System Stabilizer (PSS) for the QSE's Generation Resource or ESR is changed while the Resource is On-Line. The QSE shall also provide the Resource's AVR or PSS status logs to ERCOT upon request. For each Generation Resource that is On-Line but not producing real power and is not capable of providing Reactive Power, each QSE must still telemeter its AVR status to ERCOT but is not required to provide verbal notifications of its AVR status changes to ERCOT during these operating conditions.

(4) Each QSE shall immediately report to ERCOT and the TSP any inability of the QSE's Generation Resource or ESR required to meet its reactive capability requirements in these Protocols.

(5) Each QSE shall timely update the telemetered Resource Status unless in the reasonable judgment of the QSE, such compliance would create an undue threat to safety, undue risk of bodily harm, or undue damage to equipment. The QSE is excused from updating the telemetered Resource Status only for so long as the undue threat to safety, undue risk of bodily harm, or undue damage to equipment exists. The time for updating the telemetered Resource Status begins once the undue threat to safety, undue risk of bodily harm, or undue damage to equipment no longer exists.

(6) A QSE or Resource Entity may use a Generation Resource or ESR to serve Customer Load as part of a Private Microgrid Island (PMI) in any circumstance in which the Customer Load and the Resource are both disconnected from the ERCOT System due to an Outage of the transmission and/or distribution system, provided that the configuration complies with the requirements of paragraph (7) of Section 10.3.2.3, Generation Netting for ERCOT-Polled Settlement Meters, and provided that the QSE or Resource Entity has notified the Transmission and/or Distribution Service Provider (TDSP) of the establishment of a PMI configuration. The QSE shall ensure that the Load served by the Resource in the PMI configuration is de-energized at the time it is reconnected to the ERCOT System following the PMI configuration. All operations in a PMI configuration and any reconnection of Load following a PMI configuration shall be coordinated with the TDSP.

(7) A TDSP shall not intentionally disconnect, or direct another TDSP to disconnect, a Generation Resource or ESR included in a PMI configuration from the ERCOT System except in the following circumstances:

(a) An approved or accepted Planned or Maintenance Outage of a Transmission Facility reasonably requires, or would otherwise result in, the disconnection of the Resource from the ERCOT System;

(b) The Resource is a Distribution Generation Resource or Distribution Energy Storage Resource (DESR), and disconnection of the Resource is required for Distribution System maintenance;

(c) The TDSP's disconnection of the Resource is necessary to maintain the security of the TDSP's system or the ERCOT System;

(d) The TDSP's disconnection of the Resource is necessary to protect the public from a safety risk attributable to the operation of the Resource; or

(e) ERCOT directs the disconnection of the Resource.

(8) For each Intermittent Renewable Resource (IRR) synchronized to the ERCOT System and not capable of providing real power due to a lack of fuel, the Resource Entity and QSE shall send ERCOT, via telemetry, a Real-Time On-Line status and HSL and LSL of 0.

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

Commented [CP14]: Please note NPRR1226 also proposes revisions to this section.

(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.

[NPRR1239 and NPRR1249: Replace applicable portions of paragraph (4) above with the following upon system implementation:]

(4) Every hour, ERCOT shall post on the MIS Secure Area, except where otherwise stated in this paragraph (4), 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) On the ERCOT website, Shift Factors for all active transmission constraints, 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.

[NPRR1239: Replace paragraph (5) above with the following upon system implementation:]

(5) Sixty days after the applicable Operating Day, ERCOT shall post on the ERCOT website, 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 and ESRs 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 or ESR and the type of override.

(10) No sooner than sixty days after the applicable Operating Day, ERCOT shall provide to the appropriate Technical Advisory Committee (TAC) subcommittee instances of manual overrides of HDL or LDL, including the name of the Generation Resource or ESR, 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 or ESR, including the original and overridden HDL or LDL.

6.5.7.4 Base Points

(1) ERCOT shall issue a Base Point for each On-Line Generation Resource, each On-Line ESR, 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, MW output or MW consumption for ESR, and MW consumption for Controllable Load Resource;

(c) Time of the Dispatch Instruction;

(d) Flag indicating SCED has dispatched a Generation Resource, ESR, 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 or ESR 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.

[NPRR1188: Insert paragraph (2) below upon system implementation:]

(2) Each Generation Resource, ESR, and CLR shall follow ERCOT-issued Updated Desired Base Points plus any Regulation Service deployments, unless otherwise instructed by ERCOT. ERCOT-issued Updated Desired Base Points shall not include deployed Regulation Service or expected Primary Frequency Response.

[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 (positive or negative) 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.

6.5.7.6.2.2 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) Through use of an automatic Dispatch Instruction signal to deploy RRS capacity from Generation Resources, Energy Storage Resources (ESRs), ~~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, ECRS, 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) For RRS deployment that is not automatic in response to frequency deviation, ERCOT shall issue RRS deployment Dispatch Instructions over ICCP for Generation Resources, ESRs, and Controllable Load Resources and 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 or ESR 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.

[NPRR1010: Replace Section 6.5.7.6.2.2 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

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 or ESR shall be responsive to frequency deviations as defined in Section 8.5.1.1, Governor in Service. Generation Resources and ESRs 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 that are not Controllable 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, ECRS, 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 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. 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, ESRs, and Controllable Load 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 Resources assigned Non-Spin Ancillary Service Resource Responsibility effective at the top-of-hour by adjusting the Non-Spin Ancillary Service Schedule telemetry. For a Generation Resource, 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. For a Controllable Load Resource, the QSE shall set the Non-Spin Ancillary Service Schedule telemetry equal 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 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) Base Points for On-Line Generation Resources, ESRs, and Controllable Load Resources providing Non-Spin 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 of a Generation Resource 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 for ESRs with Energy Bid/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.

[NPRR1000, NPRR1010, and NPRR1188: Replace applicable portions of Section 6.5.7.6.2.3 above with the following upon system implementation for NPRR1000 or NPRR1188; 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 CLRs that are SCED qualified or by Load Resources that are not CLRs but do not have an under-frequency relay or the under-frequency relay is unarmed.

(a) CLRs awarded Non-Spin shall have an Energy Bid Curve 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 (ALR) must comply with all requirements in Section 22, Attachment O, Requirements for Aggregate Load Resource Participation in the ERCOT Markets.

(b) A Load Resource that is not a CLR 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 CLRs 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 CLR 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 CLR 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, a MW level for ESRs with Energy Bid/Offer Curve, and a MW level of energy for Generation Resources with Output Schedules and a

Dispatch Instruction for Load Resources, excluding CLRs, 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.

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 taking one or more of the following actions:

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

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

(3) ERCOT shall release ECRS from Generation Resources and Controllable Load Resources to SCED when frequency drops below 59.91 Hz and available Reg-Up is not sufficient to restore frequency. Upon deployment of Off-Line ECRS from a QSGR providing ECRS, the Resource's Ancillary Service Schedule for ECRS must be adjusted for the ERCOT instructed ECRS deployment and the Resource's status must be set to

OFFQS to be available for dispatch by SCED. Once recalled QSGRs providing ECRS must follow the decommitment process outlined in Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process.

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

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

(6) Following an ECRS deployment to SCED-dispatchable Resources, the QSE's obligation to deliver ECRS remains in effect until ERCOT issues a recall instruction or its ECRS obligation expires, whichever occurs first. Following an ECRS deployment to Load Resources, excluding Controllable Load Resources, or Resources operating in synchronous condenser fast-response mode, the QSE's obligation to deliver ECRS remains in effect until ERCOT issues a recall instruction.

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

(8) 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 Resource Responsibility within the ten-minute time frame according to its telemetered Emergency Ramp Rate.

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

(10) ERCOT shall issue instructions to release ECRS capacity provided from Generation Resources and Controllable Load Resources to SCED over ICCP and shall issue deployment instructions for Load Resources providing ECRS via XML. Such instructions shall contain the MW requested.

(11) 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 Resource 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.

(12) ERCOT shall recall automatically deployed ECRS capacity once system frequency recovers above 59.97 Hz.

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

[NPRR1010: Replace Section 6.5.7.6.2.4 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

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 taking one or more of the following actions:

(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 energy from Load Resources 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, ESRs, 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 a Load Resource that is not a Controllable Load Resource once PRC is above a pre-defined threshold, as described in the Operating Guides.

6.5.7.8 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 or ESR 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 or ESR 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 and ESRs 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 or ESRs 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.

6.5.8 Verbal Dispatch Instruction Confirmation

(1) Following the issuance of a VDI by ERCOT to a QSE for a Generation Resource or ESR, 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.

6.5.9.4 Energy Emergency Alert

(1) At times it may be necessary to reduce ERCOT System Demand because of a temporary decrease in available electricity supply. To provide orderly, predetermined procedures for curtailing Demand during such emergencies, ERCOT shall initiate and coordinate the implementation of the EEA following the steps set forth below in Section 6.5.9.4.2, EEA Levels.

(2) The goal of the EEA is to provide for maximum possible continuity of service while maintaining the integrity of the ERCOT System to reduce the chance of cascading Outages.

(3) ERCOT's operating procedures must meet the following goals:

(a) Use of market processes to the fullest extent practicable without jeopardizing the reliability of the ERCOT System;

(b) Use of RRS, ECRS, other Ancillary Services, and ERS to the extent permitted by ERCOT System conditions;

(c) Maximum use of ERCOT System capability;

(d) Maintenance of station service for nuclear-powered Generation Resources;

(e) Securing startup power for Generation Resources;

(f) Operation of Generation Resources and ESRs during loss of communication with ERCOT;

(g) Restoration of service to Loads in the manner defined in the Operating Guides; and

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

(4) ERCOT is responsible for coordinating with QSEs, TSPs, and DSPs to monitor ERCOT System conditions, initiating the EEA levels, notifying Market Participants, and coordinating the implementation of the EEA levels while maintaining transmission security limits.

[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 is responsible for coordinating with QSEs, DCTOs, TSPs, and DSPs to monitor ERCOT System conditions, initiating the EEA levels, notifying Market Participants, and coordinating the implementation of the EEA levels while maintaining transmission security limits.

(5) ERCOT, at management's discretion, may at any time issue an ERCOT-wide appeal through the public news media for voluntary energy conservation.

(6) During the EEA, ERCOT has the authority to obtain energy from non-ERCOT Control Areas using the DC Ties or by using BLTs to move load to non-ERCOT Control Areas. ERCOT maintains the authority to curtail energy schedules flowing into or out of the ERCOT System across the DC Ties in accordance with NERC scheduling guidelines.

(7) Some of the EEA steps are not applicable if transmission security violations exist. There may be insufficient time to implement all EEA levels in sequence, however, to the extent practicable, ERCOT shall use Ancillary Services that QSEs have made available in the market to maintain or restore reliability.

[NPRR1010: Replace paragraph (7) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(7) Some of the EEA steps are not applicable if transmission security violations exist. There may be insufficient time to implement all EEA levels in sequence, however, to the extent practicable, ERCOT shall use Ancillary Service capabilities of Resources in the market to maintain or restore reliability.

(8) ERCOT may immediately implement EEA Level 2 when clock-minute average system frequency falls below 59.91 Hz for 15 consecutive minutes. ERCOT may immediately

implement EEA Level 3 any time the clock-minute average system frequency falls below 59.91 Hz for 20 consecutive minutes or when steady-state frequency falls below 59.8 Hz for any duration of time. ERCOT shall immediately implement EEA Level 3 any time the steady-state frequency is below 59.5 Hz for any duration.

(9) Percentages for EEA Level 3 Load shedding will be based on the previous year's TSP peak Loads, as reported to ERCOT, and must be reviewed by ERCOT and modified annually as required.

(10) During EEA Level 2 or 3, for those constraints that meet the criteria identified in paragraph (3)(a) of Section 6.5.9.4.1, General Procedures Prior to EEA Operations, ERCOT may control the post-contingency flow to within the 15-Minute Rating in SCED. After PRC is restored to at least 3,000 MW or the Emergency Condition has ended, whichever is later, and ERCOT has determined that system conditions have improved such that the chance of re-entering into an EEA Level 2 or 3 is low, ERCOT shall restore control to the post-contingency flow to within the Emergency Rating for these constraints that utilized the 15-Minute Rating in SCED.

(11) During EEA Level 2 or 3, for those constraints that meet the criteria identified in paragraph (3)(b) of Section 6.5.9.4.1, ERCOT shall continue to enforce constraints associated with double-circuit contingencies throughout an EEA if the double-circuit failures are determined to be at high risk of occurring, due to system conditions. For all other double-circuit contingencies identified in paragraph (3)(b) of Section 6.5.9.4.1, ERCOT will enforce only the associated single-circuit contingencies during EEA Level 2 or 3. ERCOT shall resume enforcing such constraints as a double-circuit contingency after PRC is restored to at least 3,000 MW or the Emergency Condition has ended, whichever is later, and ERCOT has determined that system conditions have improved such that the chance of re-entering into an EEA Level 2 or 3 is low. For constraints related to stability limits that are not IROLs, ERCOT may elect not to enforce double-circuit contingencies during EEA Level 3 only.

6.5.9.4.2 EEA Levels

(1) ERCOT will declare an EEA Level 1 when PRC falls below 2,500 MW and is not projected to be recovered above 2,500 MW within 30 minutes without the use of the following actions that are prescribed for EEA Level 1:

(a) ERCOT shall take the following steps to maintain steady state system frequency near 60 Hz and maintain PRC above 2,000 MW:

(i) Request available Generation Resources that can perform within the expected timeframe of the emergency to come On-Line by initiating manual HRUC or through Dispatch Instructions, and request available ESRs that can perform within the expected timeframe of the emergency to come On-Line through Dispatch Instructions;

(ii) Use available DC Tie import capacity that is not already being used;

(iii) Issue a Dispatch Instruction for Resources to remain On-Line which, before start of emergency, were scheduled to come Off-Line; and

(iv) Instruct QSEs to deploy undeployed ERS-10 and ERS-30.

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

(v) At ERCOT's discretion, manually deploy, through ICCP, available RRS and ECRS capacity from Generation Resources having a Resource Status of ONSC and awarded RRS or ECRS.

(b) QSEs shall:

(i) Ensure COPs, telemetered status, and telemetered HSLs are updated and reflect all Resource delays and limitations; and

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

(i) Ensure COPs, telemetered status, telemetered HSLs, Normal Ramp Rates, Emergency Ramp Rates, and Ancillary Service capabilities are updated and reflect all Resource delays and limitations; and

(ii) Ensure that each of its ESRs suspends charging until the EEA is recalled, except under the following circumstances:

(A) The ESR has a current SCED Base Point Instruction, LFC Dispatch Instruction, or manual Dispatch Instruction to charge the ESR;

(B) The ESR is actively providing Primary Frequency Response; or

(C) The ESR is co-located behind a POI with onsite generation that is incapable of exporting additional power to the ERCOT System, in which case the ESR may continue to charge as long as maximum output to the ERCOT System is maintained.

[NPRR995: Replace paragraph (ii) above with the following upon system implementation:]

(ii) Ensure that each of its ESRs and SOESSs suspends charging until the EEA is recalled, except under the following circumstances:

(A) The ESR has a current SCED Base Point Instruction, LFC Dispatch Instruction, or manual Dispatch Instruction to charge the ESR;

(B) The ESR or SOESS is actively providing Primary Frequency Response; or

(C) The ESR or SOESS is co-located behind a POI with onsite generation that is incapable of exporting additional power to the ERCOT System, in which case the ESR may continue to charge as long as maximum output to the ERCOT System is maintained.

(2) ERCOT may declare an EEA Level 2 when the clock-minute average system frequency falls below 59.91 Hz for 15 consecutive minutes. ERCOT will declare an EEA Level 2 when PRC falls below 2,000 MW and is not projected to be recovered above 2,000 MW within 30 minutes without the use of the following actions that are prescribed for EEA Level 2:

(a) In addition to the measures associated with EEA Level 1, ERCOT shall take the following steps to maintain steady state system frequency at a minimum of 59.91 Hz and maintain PRC above 1,500 MW:

(i) Instruct TSPs and DSPs or their agents to reduce Customer Load by using existing, in-service distribution voltage reduction measures that have not already been implemented. A TSP, DSP, or their agent shall implement these instructions if distribution voltage reduction measures are available and already installed. If the TSP, DSP, or their agent determines in their sole discretion that the distribution voltage reduction would adversely affect reliability, the voltage reduction measure may be reduced, modified, or otherwise changed from maximum performance to a level of exercise that has no negative impact to reliability.

(ii) Instruct TSPs and DSPs to implement any available Load management plans to reduce Customer Load.

(iii) Instruct QSEs to deploy ECRS or RRS (controlled by high-set under-frequency relays) supplied from Load Resources. ERCOT may deploy ECRS or RRS simultaneously or separately, and in any order. ERCOT shall issue such Dispatch Instructions in accordance with the deployment methodologies described in paragraph (iv) below.

(iv) Load Resources providing ECRS that are not controlled by high-set under-frequency relays shall be deployed prior to Group 1 deployment. ERCOT shall deploy ECRS and RRS capacity supplied by Load Resources (controlled by high-set under-frequency relays) in accordance with the following:

(A) Instruct QSEs to deploy RRS with a Group 1 designation and all of the ECRS that is supplied from Load Resources (controlled by high-set under-frequency relays) by instructing the QSE representing the specific Load Resources to interrupt Group 1 Load Resources providing ECRS and RRS. QSEs shall deploy Load Resources according to the group designation and will be given some discretion to deploy additional Load Resources from any of the groups not designated for deployment if Load Resource operational considerations require such. ERCOT shall issue notification of the deployment via XML message. The deployment time within the ERCOT XML deployment message shall initiate the ten-minute deployment period;

(B) At the discretion of the ERCOT Operator, instruct QSEs to deploy RRS that is supplied from Load Resources (controlled by high-set under-frequency relays) by instructing the QSE representing the specific Load Resource to interrupt additional Load Resources providing RRS based on their group designation. ERCOT shall issue notification of the deployment via XML message. The deployment time within the ERCOT XML deployment message shall initiate the ten-minute deployment period;

(C) The ERCOT Operator may deploy Load Resources providing only ECRS (not controlled by high-set under-frequency relays) and all groups of Load Resources providing RRS and ECRS at the same time. ERCOT shall issue notification of the deployment via XML message. The deployment time within the ERCOT XML deployment message shall initiate the ten-minute deployment period; and

(D) ERCOT shall post a list of Load Resources on the MIS Certified Area immediately following the DRUC for each QSE with a Load Resource obligation which may be deployed to interrupt under paragraph (A) and paragraph (B). ERCOT shall develop a process for determining which individual Load Resource to place in each group based on a random sampling of individual Load Resources. At ERCOT's discretion, ERCOT may deploy all Load Resources at any given time during EEA Level 2.

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

(D) ERCOT shall post a list of Load Resources on the MIS Certified Area immediately following the DRUC for each QSE with a Load Resource RRS or ECRS award, which may be deployed to interrupt under paragraph (A) and paragraph (B). ERCOT shall

develop a process for determining which individual Load Resource to place in each group based on a random sampling of individual Load Resources. At ERCOT's discretion, ERCOT may deploy all Load Resources at any given time during EEA Level 2.

(v) Unless a media appeal is already in effect, ERCOT shall issue an appeal through the public news media for voluntary energy conservation; and

(vi) With the approval of the affected non-ERCOT Control Area, TSPs, DSPs, or their agents may implement transmission voltage level BLTs, which transfer Load from the ERCOT Control Area to non-ERCOT Control Areas in accordance with BLTs as defined in the Operating Guides.

(b) Confidentiality requirements regarding transmission operations and system capacity information will be lifted, as needed to restore reliability.

(3) ERCOT may declare an EEA Level 3 when the clock-minute average system frequency falls below 59.91 Hz for 20 consecutive minutes or when steady-state frequency falls below 59.8 Hz. ERCOT will declare an EEA Level 3 when PRC cannot be maintained above 1,500 MW or when the clock-minute average system frequency falls below 59.91 Hz for 25 consecutive minutes. Upon declaration of an EEA Level 3, ERCOT shall take any of the following measures as necessary to recover frequency or PRC to the minimum required levels:

(a) Instruct ESRs to suspend charging. For ESRs, ERCOT shall issue the suspension instruction via a SCED Base Point instruction, or, if otherwise necessary, via a manual Dispatch Instruction. An ESR shall suspend charging unless it is providing Primary Frequency Response, has received a charging instruction via SCED Base Point, or is carrying Reg-Down and has received a charging instruction from LFC. However, an ESR co-located behind a POI with onsite generation that is incapable of exporting additional power to the ERCOT System may continue to charge as long as maximum output to the ERCOT System is maintained.

[NPRR995: Replace paragraph (a) above with the following upon system implementation:]

(a) Instruct ESRs to suspend charging. For ESRs, the suspension instruction shall be issued via a SCED Base Point, or, if otherwise necessary, via a manual Dispatch Instruction. An ESR shall suspend charging unless it is providing Primary Frequency Response, has received a charging instruction via SCED Base Point, or is carrying Reg-Down and has received a charging instruction from LFC. An SOESS shall suspend charging unless it is providing Primary Frequency Response. However, an ESR or SOESS co-located behind a POI with onsite generation that is incapable of exporting additional power to the ERCOT System

may continue to charge as long as maximum output to the ERCOT System is maintained.

(b) Direct all TOs to shed firm Load, in 100 MW blocks, distributed as documented in the Operating Guides in order to maintain a steady state system frequency at a minimum of 59.91 Hz and to recover 1,500 MW of PRC within 30 minutes.

(i) TOs and TDSPs may:

(A) Manually shed Load connected to under-frequency relays and/or under-voltage relays pursuant to an ERCOT Load shed directive issued during EEA Level 3 so long as the TO has determined that system conditions warrant utilizing Load connected to under-frequency and/or under-voltage relays and each affected TO continues to comply with its Under-Frequency Load Shed (UFLS) obligation as described in Nodal Operating Guide Section 2.6.1, Automatic Firm Load Shedding, and its Load shed obligation as described in Nodal Operating Guide Section 4.5.3.4, Load Shed Obligation.

(B) Manually shed Load that is armed to deploy as part of the 58.5 Hz, 58.7 Hz, and anti-stall UFLS stages, such that the UFLS Load falls below the TO's 25% Load relief obligation, as described in Nodal Operating Guide Section 2.6.1, in order to meet ERCOT operating instructions for manual Load shed if all Load identified for manual Load shed and the Load identified in paragraph (A) above has been shed.

(c) Implement any appropriate measures associated with EEA Levels 1 and 2 that have not already been implemented.

6.6.3.6 Real-Time High Dispatch Limit Override Energy Payment

Commented [CP15]: Please note NPRR1190 also proposes revisions to this section.

(1) If ERCOT directs a reduction in a Generation Resource's real power output by employing a manual High Dispatch Limit (HDL) override, or issues a Verbal Dispatch Instruction (VDI) to a Generation Resource to adjust its operation to produce the same effect, and the reduction causes the QSE to suffer a demonstrable financial loss, the QSE may be eligible for a Real-Time High Dispatch Limit Override Energy Payment, as calculated below, upon providing documented proof of that loss. In order to qualify for this payment the QSE must:

(a) Have complied with ERCOT Dispatch Instructions to reduce real power output;

(b) Have either received a SCED Base Point equal to the Resource's HDL override value or received a SCED Base Point less than the Resource's output level at the

time of the instruction but greater than or equal to the instructed operating level specified in the VDI, during the 15-minute Settlement Interval;

(c) Have incurred a demonstrable financial loss associated with variable cost components of DAM obligations or energy purchase or sale provisions of bilateral contracts (as opposed to lost opportunity costs), in consequence of the HDL override or VDI that had an equivalent effect; and

(d) File a timely Settlement and billing dispute, including the following items:

(i) An attestation signed by an officer or executive with authority to bind the QSE;

(ii) The dollar amount and calculation of the financial loss by Settlement Interval;

(iii) An explanation of the nature of the loss and how it was attributable to the HDL override or equivalent VDI issued by ERCOT; and

(iv) Sufficient documentation to support the QSE's calculation of the amount of the financial loss.

(2) ERCOT may request additional supporting documentation or explanation with respect to the submitted materials within 15 Business Days of receipt. Additional information requested by ERCOT must be provided by the QSE within 15 business days of ERCOT's request. ERCOT will provide Notice of its acceptance or rejection of the claim for the High Dispatch Limit Override Energy Payment within 15 Business Days of the updated submission.

(3) The Energy Offer Curve used to calculate the Real-Time High Dispatch Limit Override Energy Payment will be the most recent valid Energy Offer Curve received by ERCOT that was effective for the disputed interval(s) when the HDL override or equivalent VDI was issued. If no curve exists for the interval being disputed, ERCOT will use the most recent valid Energy Offer Curve received before the HDL override or equivalent VDI was issued for an interval prior to the disputed interval(s).

The payment shall be calculated as follows:

$$\mathbf{HDLOEAMT}_{q,r,p,i} = \mathbf{(-1)} * \mathbf{Min}\{\mathbf{HDLOAL}_{q,r,p,i}, \mathbf{Max}(0, ((\mathbf{RTSPP}_{p,i} - \mathbf{RTRSVPOR}_{i} - \mathbf{RTRDP}_{i} - \mathbf{RTEOCOST}_{q,r,i}) * \mathbf{HDLOQTY}_{q,r,p,i}))\}$$

Where:

$$HDLOQTY_{q,r,p,i} = Max(0, (¼ (HDLOBRKP_{q,r,p,i} - AVGHDL_{q,r,p,i})))$$

$$HDLOBRKP_{q,r,p,i} = Min(AVGHASL_{q,r,p,i}, HDLOBRKPCP_{q,r,p,i})$$

The above variables are defined as follows:

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Variable	Unit	Definition
HDLOAL $_{q, r, p, i}$	$	*High Dispatch Limit override attested losses* The financial loss to the QSE due to the HDL override as attested by the QSE in accordance with paragraph (1)(d) above.
HDLOEAMT $_{q, r, p, i}$	$	*High Dispatch Limit override energy amount per QSE per Generation Resource* The payment to QSE *q* for an ERCOT-issued HDL override or equivalent VDI for Generation Resource *r* at Settlement Point *p* for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
HDLOBRKP $_{q, r, p, i}$	MW	*High Dispatch Limit override break point per QSE per Resource* The point on the Energy Offer Curve corresponding to the lesser of the AVGHASL or the interception between the RTSPP of the Generation Resource *r* represented by QSE *q* minus the Real-Time Reserve Price for On-Line Reserves and the Real-Time On-Line Reliability Deployment Price and the Energy Offer Curve of Generation Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
AVGHDL $_{q, r, p, i}$	MW	*Average High Dispatch Limit per QSE per Settlement Point per Resource* The time-weighted average of all 4-second HDL values calculated by the Resource Limit Calculator, subject to the maximum of the manual HDL override or equivalent VDI and the telemetered output or consumption, for the Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* within the 15-minute Settlement Interval *i*. For a Combined Cycle Train, the Resource *r* is a Combined Cycle Generation Resource within the Combined Cycle Train.
AVGHASL $_{q, r, p, i}$	MW	*Average High Ancillary Service Limit per QSE per Settlement Point per Resource* The time-weighted average High Ancillary Service Limit (HASL) calculated every four seconds by the Resource Limit Calculator for the Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* within the 15-minute Settlement Interval *i*. For a Combined Cycle Train, the Resource *r* is a Combined Cycle Generation Resource within the Combined Cycle Train. In the case of a VDI that is equivalent to an HDL override, this value is set equal to the HASL of Generation Resource or Controllable Load Resource *r* at the time that the VDI is issued to the QSE.
HDLOBRKPCP $_{q, r, p, i}$	MW	*High Dispatch Limit override break point at clearing price per QSE per Resource* The MW value on the Energy Offer Curve corresponding to the Real-Time Settlement Point Price of Generation Resource *r* represented by QSE *q* at Settlement Point *p* minus the Real-Time Reserve Price for On-Line Reserves and the Real-Time On-Line Reliability Deployment Price. For a combined cycle Resource, *r* is a Combined Cycle Train.
RTEOCOST $_{q, r, i}$	$/MWh	Real-Time Energy Offer Curve Cost Cap The Energy Offer Curve Cost Cap for Resource *r* represented by QSE *q*, for the Resource's generation above the LSL for the Settlement Interval *i*. See Section 4.4.9.3.3, Energy Offer Curve Cost Caps. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
HDLOQTY $_{q, r, p, i}$	MWh	*High Dispatch Limit override quantity per QSE per Generation Resource* The difference between the HDLOBRKP and the AVGHDL due to an ERCOT-issued HDL override or equivalent VDI for Generation Resource *r* represented by QSE *q* at Settlement Point *p* for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
RTSPP $_{p, i}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point*—The Real-Time Settlement Point Price at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
RTRSVPOR $_{i}$	$/MWh	*Real-Time Reserve Price for On-Line Reserves*—The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval *i*.

Variable	Unit	Definition
RTRDP$_i$	$/MWh	*Real-Time On-Line Reliability Deployment Price* The Real-Time price for the 15-minute Settlement Interval i, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder.
q	none	A QSE.
r	none	A Generation Resource.
p	none	A Resource Node Settlement Point.
i	none	A 15-minute Settlement Interval.

(4) The total compensation to each QSE for an HDL override for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{HDLOEAMTQSETOT}_{q,i} = \sum_{r} \sum_{p} \mathbf{HDLOEAMT}_{q,r,p,i}$$

The above variables are defined as follows:

Variable	Unit	Definition
HDLOEAMT$_{q,r,p,i}$	$	*High Dispatch Limit override energy amount per QSE per Generation Resource* The payment to QSE q for an ERCOT-issued HDL override or equivalent VDI for Generation Resource r at Settlement Point p for the 15-minute Settlement Interval i. For a combined cycle Resource, r is a Combined Cycle Train.
HDLOEAMTQSETOT$_{q,i}$	$	*High Dispatch Limit override energy amount QSE total per QSE*—The total of the energy payments to QSE q as compensation for HDL overrides for this QSE for the 15-minute Settlement Interval i.
Q	none	A QSE.
R	none	A Generation Resource.
P	none	A Resource Node Settlement Point.
I	none	A 15-minute Settlement Interval.

[NPRR1010: Replace Section 6.6.3.6 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.6.3.6 Real-Time High Dispatch Limit Override Energy Payment

(1) If ERCOT directs ~~a reduction in~~ a Generation Resource~~s~~ or Energy Storage Resource (ESR) to reduce real power output by employing a manual High Dispatch Limit (HDL) override, or issues a Verbal Dispatch Instruction (VDI) to a Generation Resource or ESR to adjust its operation to produce the same effect, and the reduction causes the QSE to suffer a demonstrable financial loss, the QSE may be eligible for a Real-Time High Dispatch Limit Override Energy Payment, as calculated below, upon providing documented proof of that loss. In order to qualify for this payment the QSE must:

(a) Have complied with ERCOT Dispatch Instructions to reduce real power output;

(b) Have either received a SCED Base Point equal to the Resource's HDL override value or received a SCED Base Point less than the Resource's output level at the time of the instruction but greater than or equal to the instructed operating level specified in the VDI, during the 15-minute Settlement Interval;

(c) Have incurred a demonstrable financial loss associated with variable cost components of DAM obligations or energy purchase or sale provisions of bilateral contracts (as opposed to lost opportunity costs), in consequence of the HDL override or VDI that had an equivalent effect; and

(d) File a timely Settlement and billing dispute, including the following items:

(i) An attestation signed by an officer or executive with authority to bind the QSE;

(ii) The dollar amount and calculation of the financial loss by Settlement Interval;

(iii) An explanation of the nature of the loss and how it was attributable to the HDL override or equivalent VDI issued by ERCOT; and

(iv) Sufficient documentation to support the QSE's calculation of the amount of the financial loss.

(2) ERCOT may request additional supporting documentation or explanation with respect to the submitted materials within 15 Business Days of receipt. Additional information requested by ERCOT must be provided by the QSE within 15 Business Days of ERCOT's request. ERCOT will provide Notice of its acceptance or rejection of the claim for the High Dispatch Limit Override Energy Payment within 15 Business Days of the updated submission.

(3) The Energy Offer Curve or Energy Bid/Offer Curve used to calculate the Real-Time High Dispatch Limit Override Energy Payment will be the most recent valid Energy Offer Curve or Energy Bid/Offer Curve received by ERCOT that was effective for the disputed interval(s) when the HDL override or equivalent VDI was issued. If no curve exists for the interval being disputed, ERCOT will use the most recent valid Energy Offer Curve or Energy Bid/Offer Curve received before the HDL override or equivalent VDI was issued for an interval prior to the disputed interval(s).

(4) The amount recoverable under this section shall be offset by any Ancillary Service Imbalance revenues received by the QSE that the QSE would not have earned had ERCOT not issued an HDL override.

The payment shall be calculated as follows:

HDLOEAMT $_{q, r, p, i}$ = (-1) * Min {HDLOAL $_{q, r, p, i}$, Max(0, ((RTSPP $_{p, i}$ – RTRDP $_{i}$ – RTEOCOST $_{q, r, i}$) * HDLOQTY $_{q, r, p, i}$))}

Where:

HDLOQTY $_{q, r, p, i}$ = Max(0, (¼ (HDLOBRKP $_{q, r, p, i}$ – AVGHDL $_{q, r, p, i}$)))

HDLOBRKP $_{q, r, p, i}$ = Min(AVGHSL $_{q, r, p, i}$, HDLOBRKPCP $_{q, r, p, i}$)

The above variables are defined as follows:

Variable	Unit	Definition
HDLOAL $_{q, r, p, i}$	$	*High Dispatch Limit override attested losses*—The financial loss to the Resource *r* represented by QSE *q* due to the HDL override as attested by the QSE in accordance with paragraph (1)(d) above. For a combined cycle Resource, *r* is a Combined Cycle Train.
HDLOEAMT $_{q, r, p, i}$	$	*High Dispatch Limit override energy amount per QSE per Generation Resource* The payment to QSE *q* for an ERCOT-issued HDL override or equivalent VDI for ~~Generation~~ Resource *r* at Settlement Point *p* for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
HDLOBRKP $_{q, r, p, i}$	MW	*High Dispatch Limit override break point per QSE per Resource*—The point on the Energy Offer Curve or Energy Bid/Offer Curve corresponding to the lesser of the AVGHSL or the interception between the RTSPP of the ~~Generation~~ Resource *r* represented by QSE *q* minus the Real-Time Reliability Deployment Price for Energy and the Energy Offer Curve Cost Cap of ~~Generation~~ Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
AVGHDL $_{q, r, p, i}$	MW	*Average High Dispatch Limit per QSE per Settlement Point per Resource*—The time-weighted average of all 4-second HDL values calculated by the Resource Limit Calculator, subject to the maximum of the manual HDL override or equivalent VDI and the telemetered output ~~or consumption~~, for the Generation Resource or ESR ~~or Controllable Load Resource~~ *r* represented by QSE *q* at Settlement Point *p* within the 15-minute Settlement Interval *i*. For a Combined Cycle Train, the Resource *r* is a ~~Combined Cycle Generation Resource within the~~ Combined Cycle Train.
AVGHSL $_{q, r, p, i}$	MW	*Average High Sustained Limit per QSE per Settlement Point per Resource* The time-weighted average High Sustained Limit (HSL) for the Generation Resource or ESR ~~or Controllable Load Resource~~ *r* represented by QSE *q* at Settlement Point *p* within the 15-minute Settlement Interval *i*. For a Combined Cycle Train, the Resource *r* is a ~~Combined Cycle Generation Resource within the~~ Combined Cycle Train. In the case of a VDI that is equivalent to an HDL override, this value is set equal to the HSL of Generation Resource or ESR ~~or Controllable Load Resource~~ *r* at the time that the VDI is issued to the QSE.
HDLOBRKPCP $_{q, r, p, i}$	MW	*High Dispatch Limit override break point at clearing price per QSE per Resource*—The MW value on the Energy Offer Curve or Energy Bid/Offer Curve corresponding to the Real-Time Settlement Point Price of ~~Generation~~ Resource *r* represented by QSE *q* at Settlement Point *p* minus the Real-Time Reliability Deployment Price for Energy. For a combined cycle Resource, *r* is a Combined Cycle Train.

$RTEOCOST_{q,r,i}$	$/MWh	*Real-Time Energy Offer Curve Cost Cap* The Energy Offer Curve Cost Cap for Resource *r* represented by QSE *q*, for the Resource's generation above the Low Sustained Limit (LSL) for the Settlement Interval *i*. See Section 4.4.9.3.3, Energy Offer Curve Cost Caps. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
$HDLOQTY_{q,r,p,i}$	MWh	*High Dispatch Limit override quantity per QSE per Generation Resource* The difference between the HDLOBRKP and the AVGHDL due to an ERCOT-issued HDL override or equivalent VDI for ~~Generation~~ Resource *r* represented by QSE *q* at Settlement Point *p* for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
$RTSPP_{p,i}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point*—The Real-Time Settlement Point Price at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$RTRDP_i$	$/MWh	*Real-Time Reliability Deployment Price for Energy*—The Real-Time price for the 15-minute Settlement Interval *i*, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time Reliability Deployment Price Adder for Energy.
q	none	A QSE.
r	none	A Generation Resource or ESR.
p	none	A Resource Node Settlement Point.
i	none	A 15-minute Settlement Interval.

(5) The total compensation to each QSE for an HDL override for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{HDLOEAMTQSETOT}_{q,i} = \sum_{r} \sum_{p} \mathbf{HDLOEAMT}_{q,r,p,i}$$

The above variables are defined as follows:

Variable	Unit	Definition
$HDLOEAMT_{q,r,p,i}$	$	*High Dispatch Limit override energy amount per QSE per ~~Generation~~ Resource*—The payment to QSE *q* for an ERCOT-issued HDL override or equivalent VDI for ~~Generation~~ Resource *r* at Settlement Point *p* for the 15-minute Settlement Interval *i*. For a combined cycle Resource, *r* is a Combined Cycle Train.
$HDLOEAMTQSETOT_{q,i}$	$	*High Dispatch Limit override energy amount QSE total per QSE*—The total of the energy payments to QSE *q* as compensation for HDL overrides for this QSE for the 15-minute Settlement Interval *i*.
Q	none	A QSE.
R	none	A Generation Resource or ESR.
P	none	A Resource Node Settlement Point.
i	none	A 15-minute Settlement Interval.

[NPRR879, NPRR963, and NPRR1010: Replace applicable portions of Section 6.6.5.1.1.1 above with the following upon system implementation for NPRR879 or NPRR963; or upon system

implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; and renumber accordingly:]

6.6.5.2 Set Point Deviation Charge for Over Generation

(1) ~~For Generation Resources that are not Energy Storage Resources (ESRs),~~ ERCOT shall charge a QSE for a Generation Resource, including an Intermittent Renewable Resource (IRR) with an Ancillary Service award for at least one SCED interval within the 15-minute Settlement Interval, for over-generation that exceeds the following tolerance. The tolerance is the greater of:

(a) 5% of the AASP in the Settlement Interval; or

(b) Five MW above the AASP in the Settlement Interval.

(2) For instances in which an IRR has not received an Ancillary Service award or is not part of an IRR Group in which an IRR receives an Ancillary Service award for any SCED interval within the 15-minute Settlement Interval, Set Point Deviation Charges will be determined per Section 6.6.5.4, IRR Generation Resource Set Point Deviation Charge.

(3) The over-generation charge to each QSE for each Generation Resource, that is not part of an IRR Group ~~or an ESR,~~ at each Resource Node Settlement Point is calculated as follows:

$$\mathbf{SPDAMT}_{q,r,p,i} = \mathbf{Max\ (PR1, RTSPP}_{p,i}\mathbf{)} * \mathbf{OGEN}_{q,r,p,i}$$

Where:

$$OGEN_{q,r,p,i} = Max\ [0, (TWTG_{q,r,p,i} - \tfrac{1}{4} * Max\ (((1 + K1) * AASP_{q,r,p,i}), (AASP_{q,r,p,i} + Q1)))]$$

$$TWTG_{q,r,p,i} = \left(\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3\right) * \tfrac{1}{4}$$

(4) If any IRR in an IRR Group is awarded Ancillary Services for at least one SCED interval within the 15-minute Settlement Interval, then the deviation penalty is determined for the IRR Group and evenly allocated and charged to each IRR within that IRR Group as follows:

$$\mathbf{SPDAMT}_{q,r,p,i} = \mathbf{Max\ (PR1, RTSPP}_{p,i}\mathbf{)} * \mathbf{OGEN}_{q,r,p,i}$$

Where:

$$OGEN_{q,r,p,i} = Max\ [0, (TWTG_{q,wg,p,i} - \tfrac{1}{4} * Max\ (((1 + K1) * AASP_{q,wg,p,i}), (AASP_{q,wg,p,i} + Q1)))] / N$$

$$TWTG_{q,wg,p,i} = \sum_{r} \left(\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3\right) * \tfrac{1}{4}$$

$$AASP_{q,wg,p,i} = \sum_{r}(AASP_{q,r,p,i})$$

The above variables are defined as follows:

Variable	Unit	Definition
$SPDAMT_{q,r,p,i}$	$	*Set Point Deviation Charge per QSE per Settlement Point per Resource* The charge to QSE *q* for Generation Resource *r* at Resource Node *p*, for its deviation from AASP, for the 15-minute Settlement Interval *i*. The Set Point Deviation Charge is charged to the Combined Cycle Train for all Combined Cycle Generation Resources.
$RTSPP_{p,i}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point*—The Real-Time Settlement Point Price at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$TWTG_{q,r,p,i}$	MWh	*Time-Weighted Telemetered Generation per QSE per Settlement Point per Resource*—The telemetered generation of Generation Resource *r* represented by QSE *q* at Resource Node *p*, for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
$AASP_{q,r,p,i}$	MW	*Average Aggregated Set Point per QSE per Settlement Point per Resource* The average of the Average Five Minute Clock Interval Set Point (AVGSP5M) of Generation Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, AASP is calculated for the Combined Cycle Train considering all UDSPs to any Combined Cycle Generation Resources within the Combined Cycle Train.
$AVGTG5M_{q,r,p,i,y}$	MW	*Average Telemetered Generation for the 5 Minutes*—The average telemetered generation of Generation Resource *r* represented by QSE *q* at Resource Node *p*, for the five-minute clock interval *y*, within the 15-minute Settlement Interval *i*.
$OGEN_{q,r,p,i}$	MWh	*Over Generation Volumes per QSE per Settlement Point per Resource* The amount over-generated by the Generation Resource *r* represented by QSE *q* at Resource Node *p* for the 15-minute Settlement Interval *i*.
PR1	$/MWh	The price to use for the Set Point Deviation Charge for over-generation when RTSPP is less than $20/MWh. $20/MWh.
K1	none	The percentage tolerance for over-generation, 5%.
Q1	MW	The MW tolerance for over-generation, five MW.
N	none	The number of IRRs within an IRR Group.
Q	none	A QSE.
P	none	A Settlement Point.
R	none	A non-exempt Generation Resource.
y	none	A five-minute clock interval in the Settlement Interval.
i	none	A 15-minute Settlement Interval.
Wg	none	An IRR Group.

[NPRR879, NPRR963, and NPRR1010: Replace applicable portions of Section 6.6.5.1.1.2 above with the following upon system implementation for NPRR879 or NPRR963; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.6.5.2.1 Set Point Deviation Charge for Under Generation

(1) ~~For Generation Resources that are not FSRs,~~ ERCOT shall charge a QSE for a Generation Resource, including an IRR awarded Ancillary Service for at least one SCED interval within the 15-minute Settlement Interval, for under-generation if the telemetered generation is below the lesser of:

(a) 95% of the AASP in the Settlement Interval; or

(b) The AASP in the Settlement Interval minus five MW.

(2) For instances in which an IRR is not awarded Ancillary Service or is not part of an IRR Group in which an IRR is awarded Ancillary Service for any SCED interval within the 15-minute Settlement Interval, Set Point Deviation Charges will be determined per Section 6.6.5.4, IRR Generation Resource Set Point Deviation Charge.

(3) The under-generation charge to each QSE for each Generation Resource, that is not part of an IRR Group ~~or an FSR,~~ at each Resource Node Settlement Point for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{SPDAMT}_{q,r,p,i} = \mathbf{-1 * Min\ (PR2,\ RTSPP}_{p,i}\mathbf{)\ *\ Min\ (1,\ KP)\ *\ UGEN}_{q,r,p,i}$$

Where:

$$UGEN_{q,r,p,i} = \text{Max}\ [0,\ [\text{Min}\ ((1 - K2) * \tfrac{1}{4} * AASP_{q,r,p,i},\ \tfrac{1}{4} * (AASP_{q,r,p,i} - Q2)) - TWTG_{q,r,p,i}]]$$

$$TWTG_{q,r,p,i} = \left(\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3\right) * \tfrac{1}{4}$$

(4) If any IRR in an IRR Group is awarded Ancillary Service for at least one SCED interval within the 15-minute Settlement Interval, then the deviation penalty is determined for the IRR Group and evenly allocated and charged to each IRR within that IRR Group as follows:

$$\mathbf{SPDAMT}_{q,r,p,i} = \mathbf{-1 * Min\ (PR2,\ RTSPP}_{p,i}\mathbf{)\ *\ Min\ (1,\ KP)\ *\ UGEN}_{q,r,p,i}$$

Where:

$$UGEN_{q,r,p,i} = \text{Max}\ [0,\ [\text{Min}\ ((1 - K2) * \tfrac{1}{4} * AASP_{q,wg,p,i},\ \tfrac{1}{4} * (AASP_{q,wg,p,i} - Q2)) - TWTG_{q,wg,p,i}]] / N$$

$$TWTG_{q,wg,p,i} = \sum_{r} \left(\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3\right) * \tfrac{1}{4}$$

$$AASP_{q,wg,p,i} = \sum_{r} (AASP_{q,r,p,i})$$

The above variables are defined as follows:

Variable	Unit	Definition
$SPDAMT_{q,r,p,i}$	$	*Set Point Deviation Charge per QSE per Settlement Point per Resource* The charge to QSE *q* for Generation Resource *r* at Resource Node *p*, for its deviation from AASP, for the 15-minute Settlement Interval *i*. A Set Point Deviation Charge is charged to the Combined Cycle Train for all Combined Cycle Generation Resources.
$RTSPP_{p,i}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point*—The Real-Time Settlement Point Price at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$TWTG_{q,r,p,i}$	MWh	*Time-Weighted Telemetered Generation per QSE per Settlement Point per Resource*—The telemetered generation of Generation Resource *r* represented by QSE *q* at Resource Node *p*, for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
$AASP_{q,r,p,i}$	MW	*Average Aggregated Set Point* The average of the Average Five Minute Clock Interval Set Point (AVGSP5M) of Generation Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, AASP is calculated for the Combined Cycle Train considering all UDSPs to any Combined Cycle Generation Resources within the Combined Cycle Train.
$AVGTG5M_{q,r,p,i,y}$	MW	*Average Telemetered Generation for the 5 Minutes* —The average telemetered generation of Generation Resource *r* represented by QSE *q* at Resource Node *p*, for the five-minute clock interval *y*, within the 15-minute Settlement Interval *i*.
$UGEN_{q,r,p,i}$	MWh	*Under-Generation Volumes per QSE per Settlement Point per Resource* The amount under-generated by the Generation Resource *r* represented by QSE *q* at Resource Node *p* for the 15-minute Settlement Interval *i*.
KP	none	The coefficient applied to the Settlement Point Price for under-generation charge, 1.0.
PR2	$/MWh	The price to use for the Set Point Deviation Charge for under-generation calculation when RTSPP is greater than -$20/MWh, -$20/MWh.
K2	none	The percentage tolerance for under-generation, 5%.
Q2	MW	The MW tolerance for under-generation, five MW.
N	none	The number of IRRs within an IRR Group.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A non-exempt Generation Resource.
y	none	A five-minute clock interval in the Settlement Interval.
i	none	A 15-minute Settlement Interval.
wg	none	An IRR Group.

6.6.5.4 Base Point Deviation Payment

(1) ERCOT shall pay the Base Point Deviation Charges collected from the QSEs representing Resources to the QSEs representing Load based on LRS. The payment to each QSE for a given 15-minute Settlement Interval is calculated as follows:

$LABPDAMT_q$ = (-1) * BPDAMTTOT * LRS_q

Where:

$$BPDAMTTOT = \sum_{q} BPDAMTQSETOT_q$$

$$BPDAMTQSETOT_q = \sum_{p} \sum_{r} BPDAMT_{q,r,p}$$

The above variables are defined as follows:

Variable	Unit	Definition
$LABPDAMT_q$	$	*Load-Allocated Base Point Deviation Amount per QSE* QSE *q*'s share of the total charge for all Resources' Base Point deviations, based on LRS for the 15-minute Settlement Interval.
BPDAMTTOT	$	*Base Point Deviation Amount Total* The total of Base Point Deviation Charges to all QSEs for all Resources, for the 15-minute Settlement Interval.
$BPDAMTQSETOT_q$	$	*Base Point Deviation Amount QSE Total per QSE*—The total of Base Point Deviation Charges to QSE *q* for all Resources represented by this QSE, for the 15-minute Settlement Interval.
$BPDAMT_{q,r,p}$	$	*Base Point Deviation Charge per QSE per Settlement Point per Resource* The charge to QSE *q* for Generation Resource or Controllable Load Resource *r* at Settlement Node *p*, for its deviation from Base Point, for the 15-minute Settlement Interval. A Base Point Deviation Charge is charged to the Combined Cycle Train for all Combined Cycle Generation Resources.
LRS_q	none	The LRS calculated for QSE *q* for the 15-minute Settlement Interval. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Generation Resource or Controllable Load Resource.

[NPRR1010: Replace Section 6.6.5.4 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.6.5.4 Set Point Deviation Payment

(1) ERCOT shall pay the Set Point Deviation Charges collected from the QSEs representing Resources to the QSEs representing Load based on LRS. The payment to each QSE for a given 15-minute Settlement Interval is calculated as follows:

LASPDAMT $_q$ = (-1) * SPDAMTTOT * LRS $_q$

Where:

SPDAMTTOT = $\sum_{q}$ SPDAMTQSETOT $_q$

SPDAMTQSETOT $_q$ = $\sum_{r}\sum_{p}$ SPDAMT $_{q,r,p}$

The above variables are defined as follows:

Variable	Unit	Definition
LASPDAMT $_q$	$	*Load-Allocated Set Point Deviation Amount per QSE* QSE *q*'s share of the total charge for all Resources' Set Point deviations, based on LRS for the 15-minute Settlement Interval.
SPDAMTTOT	$	*Set Point Deviation Amount Total* The total of Set Point Deviation Charges to all QSEs for all Resources, for the 15-minute Settlement Interval.
SPDAMTQSETOT $_q$	$	*Set Point Deviation Amount QSE Total per QSE*—The total of Set Point Deviation Charges to QSE *q* for all Resources represented by this QSE, for the 15-minute Settlement Interval.
SPDAMT $_{q,r,p}$	$	*Set Point Deviation Charge per QSE per Settlement Point per Resource* The charge to QSE *q* for ~~Generation Resource or Controllable Load~~ Resource *r* at Settlement Node *p*, for its deviation from AASP, for the 15-minute Settlement Interval. A Set Point Deviation Charge is charged to the Combined Cycle Train for all Combined Cycle Generation Resources.
LRS $_q$	none	The LRS calculated for QSE *q* for the 15-minute Settlement Interval. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Generation Resource, ESR, or Controllable Load Resource.

6.6.7.1 Voltage Support Service Payments

(1) All other Generation Resources shall be eligible for compensation for Reactive Power production in accordance with Section 6.5.7.7, Voltage Support Service, only if ERCOT issues a Dispatch Instruction that results in the following unit operation:

(a) When ERCOT instructs the Generation Resource to exceed its Unit Reactive Limit (URL) and the Generation Resource provides additional Reactive Power, then ERCOT shall pay for the additional Reactive Power provided at a price that recognizes the avoided cost of reactive support to Resources on the transmission network.

(b) Any real power reduction directed by ERCOT through VDIs to provide for additional reactive capability for voltage support must be compensated as a lost opportunity payment.

(2) The payment for a given 15-minute Settlement Interval to each QSE representing a Generation Resource that operates in accordance with an ERCOT Dispatch Instruction is calculated as follows:

Depending on the Dispatch Instruction, payment for Volt-Amperes reactive (VAr):

If $VSSVARLAG_{q,r} > 0$

$$\mathbf{VSSVARAMT_{q,r}} = \mathbf{(-1) * VSSVARPR * VSSVARLAG_{q,r}}$$

If $VSSVARLEAD_{q,r} > 0$

$$\mathbf{VSSVARAMT_{q,r}} = \mathbf{(-1) * VSSVARPR * VSSVARLEAD_{q,r}}$$

Where:

$$VSSVARLAG_{q,r} = \text{Max}\,[0, \text{Min}\,(¼ * VSSVARIOL_{q,r}, RTVAR_{q,r}) - (¼ * URLLAG_{q,r})]$$

$$VSSVARLEAD_{q,r} = \text{Max}\,\{0, [(¼ * URLLEAD_{q,r}) - \text{Max}\,((¼ * VSSVARIOL_{q,r}), RTVAR_{q,r})]\}$$

$$URLLAG_{q,r} = 0.32868 * HSL_{q,r}$$

$$URLLEAD_{q,r} = (-1) * 0.32868 * HSL_{q,r}$$

The above variables are defined as follows:

Variable	Unit	Definition
$VSSVARAMT_{q,r}$	$	*Voltage Support Service VAr Amount per QSE per Generation Resource* - The payment to QSE *q* for the VSS provided by Generation Resource *r*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
VSSVARPR	$/MVArh	*Voltage Support Service VAr Price* - The price for instructed MVAr beyond a Generation Resource's URL currently is $2.65/MVArh (based on $50.00/installed kVAr).
$VSSVARLAG_{q,r}$	MVArh	*Voltage Support Service VAr Lagging per QSE per Generation Resource* - The instructed portion of the Reactive Power above the Generation Resource's lagging URL for Generation Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$VSSVARLEAD_{q,r}$	MVArh	*Voltage Support Service VAr Leading per QSE per Generation Resource* - The instructed portion of the Reactive Power below the Generation Resource's leading URL for Generation Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.

Variable	Unit	Definition
$VSSVARIOL_{i,r}$	MVAr	*Voltage Support Service VAr Instructed Output Level per QSE per Generation Resource*—The instructed Reactive Power output level of Generation Resource *r* represented by QSE *q*, lagging Reactive Power if positive and leading Reactive Power if negative, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$RTVAR_{q,r}$	MVArh	*Real-Time VAr per QSE per Resource* The netted Reactive Energy measured for Generation Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$URLLAG_{q,r}$	MVAr	*Unit Reactive Limit Lagging per QSE per Resource*—The URL for lagging Reactive Power of the Generation Resource *r* represented by QSE *q* as determined in accordance with these Protocols. Its value is positive. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$URLLEAD_{i,r}$	MVAr	*Unit Reactive Limit Leading per QSE per Resource*—The URL for leading Reactive Power of the Generation Resource *r* represented by QSE *q* as determined in accordance with these Protocols. Its value is negative. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$HSL_{q,r}$	MW	*High Sustained Limit*—The HSL of a Generation Resource as defined in Section 2, Definitions and Acronyms, for the hour that includes the Settlement Interval *i*. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.
q	none	A QSE.
r	none	A Generation Resource.

(3) The total additional compensation to each QSE for VSS for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{VSSVARAMTQSETOT_q} = \sum_{r} \mathbf{VSSVARAMT_{q,r}}$$

Variable	Unit	Definition
$VSSVARAMT_{i,r}$	$	*Voltage Support Service VAr Amount per QSE per Generation Resource* The payment to QSE *q* for the VSS provided by Generation Resource *r*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$VSSVARAMTQSETOT_{i,q}$	$	*Voltage Support VAr Amount QSE total per QSE* The total of the payments to QSE *q* as compensation for VSS by this QSE for the 15-minute Settlement Interval.
q	none	A QSE.
r	none	A Generation Resource.

(4) The lost opportunity payment, if applicable:

$$\mathbf{VSSEAMT_{q,r} = (-1) * Max\ (0,\ (RTSPP_p - RTEOCOST_{q,r,i}) * Max\ (0,\ (HSL_{q,r} * 1/4 - RTMG_{q,r}))}$$

The above variables are defined as follows:

Variable	Unit	Definition
$VSSEAMT_{q,r}$	$	*Voltage Support Service Energy Amount per QSE per Generation Resource*—The lost opportunity payment to QSE *q* for ERCOT-directed VSS from Generation Resource *r* for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$RTMG_{q,r}$	MWh	*Real-Time Metered Generation per QSE per Resource*—The Real-Time metered generation of Generation Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$RTSPP_{p}$	$/MWh	*Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Resource Node for the 15-minute Settlement Interval.
$RTEOCOST_{q,r,i}$	$/MWh	*Real-Time Energy Offer Curve Cost*—The Energy Offer Curve Cost for Resource *r* represented by QSE *q*, for the Resource's generation above the LSL for the Settlement Interval *i*. See Section 4.4.9.3.3, Energy Offer Curve Costs. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
$HSL_{q,r,p}$	MW	*High Sustained Limit Generation per QSE per Settlement Point per Resource*—The HSL of Generation Resource *r* represented by QSE *q* at Resource Node *p* for the hour that includes the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.
$LSL_{q,r,p}$	MW	*Low Sustained Limit Generation per QSE per Settlement Point per Resource* The LSL of Generation Resource *r* represented by QSE *q* at Resource Node *p* for the hour that includes the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.
q	none	A QSE.
r	none	A Generation Resource.
p	none	A Resource Node Settlement Point.

(5) The total of the payments to each QSE for ERCOT-directed power reduction to provide VSS for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{VSSEAMTQSETOT}_{q} = \sum_{r} \mathbf{VSSEAMT}_{q,r}$$

The above variables are defined as follows:

Variable	Unit	Definition
$VSSEAMTQSETOT_{q}$	$	*Voltage Support Service Lost Opportunity Amount QSE Total per QSE*—The total of the lost opportunity payments to QSE *q* for providing VSS for providing ERCOT-directed VSS for the 15-minute Settlement Interval.
$VSSEAMT_{q,r}$	$	*Voltage Support Service Energy Amount per QSE per Settlement Point per Generation Resource* The lost opportunity payment to QSE *q* for ERCOT-directed VSS from Generation Resource *r* for the 15-minute Settlement Interval for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
q	none	A QSE.
r	none	A Generation Resource.

Board Report

[NPRR1014: Replace Section 6.6.7.1 above with the following upon system implementation:]

6.6.7.1 Voltage Support Service Payments

(1) All other Generation Resources or ESRs shall be eligible for compensation for Reactive Power production in accordance with Section 6.5.7.7, Voltage Support Service, only if ERCOT issues a Dispatch Instruction that results in the following unit operation:

(a) When ERCOT instructs the Generation Resource or ESR to exceed its Unit Reactive Limit (URL) and the Generation Resource or ESR provides additional Reactive Power, then ERCOT shall pay for the additional Reactive Power provided at a price that recognizes the avoided cost of reactive support to Resources on the transmission network.

(b) Any real power reduction directed by ERCOT through VDIs to provide for additional reactive capability for voltage support must be compensated as a lost opportunity payment.

(2) An ESR with a net injection for a Settlement Interval but that has a High Sustained Limit (HSL) that is less than zero will not receive compensation for Reactive Power for that Settlement Interval.

(32) The payment for a given 15-minute Settlement Interval to each QSE representing a Generation Resource or ESR that operates in accordance with an ERCOT Dispatch Instruction is calculated as follows:

Depending on the Dispatch Instruction, payment for Volt-Amperes reactive (VAr):

If $VSSVARLAG_{q,r} > 0$

$$\mathbf{VSSVARAMT_{q,r}} = \mathbf{(-1) * VSSVARPR * VSSVARLAG_{q,r}}$$

If $VSSVARLEAD_{q,r} > 0$

$$\mathbf{VSSVARAMT_{q,r}} = \mathbf{(-1) * VSSVARPR * VSSVARLEAD_{q,r}}$$

Where:

$VSSVARLAG_{q,r}$ = Max [0, Min (¼ * $VSSVARIOL_{q,r}$, $RTVAR_{q,r}$) – (¼ * $URLLAG_{q,r}$)]

$VSSVARLEAD_{q,r}$ = Max $\{0, [(¼ * URLLEAD_{q,r}) – Max ((¼ * VSSVARIOL_{q,r}), RTVAR_{q,r})]\}$

And:

If an ESR has a net withdrawal for the Settlement Interval, then:

$URLLAG_{q,r}$ = 0.32868 * ABS($LSL_{q,r}$)

$URLLEAD_{q,r}$ = (-1) * 0.32868 * ABS($LSL_{q,r}$)

Otherwise, for Generation Resources or ESRs that have a net injection for the Settlement Interval and that have an HSL greater than or equal to 0:

$URLLAG_{q,r}$ = 0.32868 * $HSL_{q,r}$

$URLLEAD_{q,r}$ = (-1) * 0.32868 * $HSL_{q,r}$

The above variables are defined as follows:

Variable	Unit	Definition
$VSSVARAMT_{q,r}$	$	*Voltage Support Service VAr Amount per QSE per Resource* - The payment to QSE *q* for the VSS provided by Resource *r*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
VSSVARPR	$/MVArh	*Voltage Support Service VAr Price* - The price for instructed MVAr beyond a Resource's URL currently is $2.65/MVArh (based on $50.00/installed kVAr).
$VSSVARLAG_{q,r}$	MVArh	*Voltage Support Service VAr Lagging per QSE per Resource* - The instructed portion of the Reactive Power above the ~~Generation~~ Resource's lagging URL for Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$VSSVARLEAD_{q,r}$	MVArh	*Voltage Support Service VAr Leading per QSE per Resource* - The instructed portion of the Reactive Power below the Resource's leading URL for Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$VSSVARIOL_{q,r}$	MVAr	*Voltage Support Service VAr Instructed Output Level per QSE per Resource* The instructed Reactive Power output level of Resource *r* represented by QSE *q*, lagging Reactive Power if positive and leading Reactive Power if negative, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$RTVAR_{q,r}$	MVArh	*Real-Time VAr per QSE per Resource*—The netted Reactive Energy measured for Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$URLLAG_{q,r}$	MVAr	*Unit Reactive Limit Lagging per QSE per Resource*—The URL for lagging Reactive Power of the Resource *r* represented by QSE *q* as determined in accordance with these Protocols. Its value is positive. Where for a combined cycle resource, *r* is a Combined Cycle Train.

$URLLEAD_{q,r}$	MVAr	*Unit Reactive Limit Leading per QSE per Resource* The URL for leading Reactive Power of the Resource *r* represented by QSE *q* as determined in accordance with these Protocols. Its value is negative. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$HSL_{q,r}$	MW	*High Sustained Limit*—The HSL of Resource *r* represented by QSE *q* as defined in Section 2, Definitions and Acronyms, for the hour that includes the Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.
$LSL_{q,r}$	MW	*Low Sustained Limit*—The LSL for Resource *r* represented by QSE *q*, as defined in Section 2, for the hour that includes the Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.
q	none	A QSE.
r	none	A Generation Resource or ESR.

(43) The total additional compensation to each QSE for voltage support service for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{VSSVARAMTQSETOT_q} = \sum_{r} \mathbf{VSSVARAMT_{q,r}}$$

Variable	Unit	Definition
$VSSVARAMT_{q,r}$	$	*Voltage Support Service VAr Amount per QSE per Resource*—The payment to QSE *q* for the VSS provided by Resource *r*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$VSSVARAMTQSETOT_{q}$	$	*Voltage Support VAr Amount QSE total per QSE*—The total of the payments to QSE *q* as compensation for VSS by this QSE for the 15-minute settlement interval.
q	None	A QSE.
r	None	A Generation Resource or ESR.

(54) The lost opportunity payment, if applicable:

If an ESR has a net withdrawal for the Settlement Interval, then:

$$\mathbf{VSSEAMT_{q,r} = (-1) * Max (0, RTSPP_p) * Max (0, (ABS(LSL_{q,r} * ¼ - NETVSSA_{q,r})))}$$

Otherwise, for Generation Resources or ESRs that have a net injection for the Settlement Interval:

$$\mathbf{VSSEAMT_{q,r} = (-1) * Max (0, (RTSPP_p - RTEOCOST_{q,r,i}) * Max (0, (HSL_{q,r} * ¼ - NETVSSA_{q,r})))}$$

Where:

$$NETVSSA_{q,r} = RTCL_{q,r} + RTMG_{q,r}$$

For an ESR that is not a WSL:

$$RTCL_{q,r} = \sum_{b} MEBR_{q,r,b}$$

And for an ESR that is a WSL:

$$RTCL_{q,r} = \sum_{b} MEBL_{q,r,b}$$

The above variables are defined as follows:

Variable	Unit	Definition
$VSSEAMT_{q,r}$	$	*Voltage Support Service Energy Amount per QSE per Resource* The lost opportunity payment to QSE *q* for ERCOT-directed VSS from Resource *r* for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$RTMG_{q,r}$	MWh	*Real-Time Metered Generation per QSE per Resource* The Real-Time metered generation of Resource *r* represented by QSE *q*, for the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Train.
$RTSPP_{p}$	$/MWh	*Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Resource Node for the 15-minute Settlement Interval.
$RTEOCOST_{q,r,i}$	$/MWh	Real-Time Energy Offer Curve Cost - The Energy Offer Curve Cost for Resource *r* represented by QSE *q*, for the Resource's generation above the LSL for the Settlement Interval *i*. See Section 4.4.9.3.3, Energy Offer Curve Costs. ~~Where for an ESR, RTEOCOST shall be set to zero.~~ Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
$NETVSSA_{q,r}$	MWh	*Net VSS Activity* The sum of the total energy metered by the Settlement Meter which measures ESR load and the RTMG, for Resource *r* represented by the QSE *q* for the 15-minute Settlement Interval.
$RTCL_{q,r}$	MWh	*Real-Time Charging Load per QSE per Resource* The charging load for Resource *r* represented by the QSE *q*, represented as a negative value, for the 15-minute Settlement Interval.
$MEBL_{q,r,b}$	MWh	*Metered Energy for Wholesale Storage Load at ~~b~~Bus* The WSL energy metered by the Settlement Meter which measures WSL for the 15-minute Settlement Interval represented as a negative value, for the QSE *q*, Resource *r*, at bus *b*.
$MEBR_{q,r,b}$	MWh	*Metered Energy for Energy Storage Resource load at Bus* - The energy metered by the Settlement Meter which measures ESR load that is not WSL for the 15-minute Settlement Interval represented as a negative value, for the QSE *q*, Resource *r*, at bus *b*.
$HSL_{p,r}$	MW	*High Sustained Limit per QSE per Settlement Point per Resource*—The HSL of Resource *r* represented by QSE *q* at Resource Node *p* for the hour that includes the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.
$LSL_{p,r}$	MW	*Low Sustained Limit per QSE per Settlement Point per Resource*—The LSL of Resource *r* represented by QSE *q* at Resource Node *p* for the hour that includes the 15-minute Settlement Interval. Where for a combined cycle resource, *r* is a Combined Cycle Generation Resource.

q	none	A QSE.
r	none	A Generation Resource or ESR.
p	none	A Resource Node Settlement Point.
b	none	An Electrical Bus.

(6~~5~~) The total of the payments to each QSE for ERCOT-directed power reduction to provide VSS for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{VSSEAMTQSETOT}_{q} = \sum_{r} \mathbf{VSSEAMT}_{q,r}$$

The above variables are defined as follows:

Variable	Unit	Definition
$\mathrm{VSSEAMTQSETOT}_{q}$	$	*Voltage Support Service Lost Opportunity Amount QSE Total per QSE* The total of the lost opportunity payments to QSE q for providing VSS for providing ERCOT-directed VSS for the 15-minute Settlement Interval.
$\mathrm{VSSEAMT}_{q,r}$	$	*Voltage Support Service Energy Amount per QSE per Settlement Point per Resource* The lost opportunity payment to QSE q for ERCOT-directed VSS from Resource r for the 15-minute Settlement Interval for the 15-minute Settlement Interval. Where for a combined cycle resource, r is a Combined Cycle Train.
q	none	A QSE.
r	none	A Generation Resource or ESR.

6.6.9 Emergency Operations Settlement

(1) Due to Emergency Conditions or Watches, additional compensation for each Generation Resource for which ERCOT provides an Emergency Base Point may be awarded to the QSE representing the Generation Resource. If the Emergency Base Point is higher than the SCED Base Point immediately before the Emergency Condition or Watch and the Settlement Point Price at the Resource Node is lower than the Generation Resource's Energy Offer Curve price at the Emergency Base Point, ERCOT shall pay the QSE additional compensation for the additional energy above the SCED Base Point.

(2) In accordance with paragraph (8) of Section 8.1.1.2, General Capacity Testing Requirements, QSEs that receive a VDI to operate the designated Generation Resource for an unannounced Generation Resource test may be considered for additional compensation utilizing the formula as stated in Section 6.6.9.1, Payment for Emergency Power Increase Directed by ERCOT. If the test period SCED Base Point is higher than the SCED Base Point immediately before the test period and the Settlement Point Price at the Resource Node is lower than the Generation Resource's Energy Offer Curve price, or MOC if no offer exists, at the test Base Point, and the test was not a retest requested by the QSE, ERCOT shall pay the QSE additional compensation for the additional energy above the pre-test SCED Base Point. For the purpose of this Settlement, and limited to

Settlement Intervals inclusive of the unannounced Generation Resource test, SCED Base Points will be used in place of the Emergency Base Point.

(3) A QSE that represents a QSGR that comes On-Line as a result of a Base Point greater than zero shall be considered for additional compensation using the formula in Section 6.6.9.1 when the Base Point is less than or equal to its applicable Seasonal net minimum sustainable rating provided in the Resource Registration data. If the Resource Settlement Point Price at the QSGR's Resource Node is lower than the Energy Offer Curve price, capped per the MOC pursuant to Section 4.4.9.4.1, Mitigated Offer Cap, at the aggregated Base Point during the 15-minute Settlement Interval, ERCOT shall pay the QSE additional compensation for the amount of energy from the Off-Line zero Base Point to the aggregated output level. For the purpose of this Settlement, inclusive of the first Settlement Interval in which the QSGR is deployed by SCED from a current SCED Base Point equal to zero MW to a Base Point greater than zero, SCED Base Points will be used in place of the Emergency Base Point. The compensation specified in this paragraph continues over all applicable Intervals until SCED no longer needs the QSGR to generate energy pursuant to Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process, and there is no manual Low Dispatch Limit (LDL) override in place on the QSGR.

(4) QSEs that received Base Points that are inconsistent with Real-Time Settlement Point Prices and QSEs that receive a manual override from the ERCOT Operator shall be considered for additional compensation using the formula in Section 6.6.9.1. If the Resource Settlement Point Price at the Resource Node is lower than the Energy Offer Curve price, capped per the MOC pursuant to Section 4.4.9.4.1, at the held Base Point during the 15-minute Settlement Interval, ERCOT shall pay the QSE additional compensation for the amount of energy from a zero Base Point to the held Base Point. The held Base Point is the Base Point that the QSE received due to a manual override by ERCOT Operator or the Base Point received by the QSE that ERCOT identified as inconsistent with Real-Time Settlement Point Prices. For the purpose of this Settlement, and limited to the held Settlement Intervals inclusive of the manual override or Base Points identified as inconsistent with prices, SCED Base Points will be used in place of the Emergency Base Point.

(5) In accordance with Section 6.3, Adjustment Period and Real-Time Operations Timeline, if ERCOT sets any SCED interval as failed, then QSEs shall be considered for additional compensation using the formula in Section 6.6.9.1. For the purpose of this Settlement, and limited to the failed SCED interval, SCED Base Points will be used in place of the Emergency Base Point.

(6) For each 15-minute Settlement Interval, a QSGR that receives a manual override from the ERCOT Operator shall only be considered for compensation under paragraph (4) above.

(7) For a QSGR, the MOC curve used to cap the Energy Offer Curve shall not include the variable Operations and Maintenance (O&M) adjustment cost to start the Resource from first fire to LSL, including the startup fuel described in paragraph (1)(c) of Section

4.4.9.4.1 for all emergency operations Settlement calculations with the exception of paragraph (3) above.

(8) QSEs that receive a VDI to operate its Resources for an unannounced CFC test, as described in the ERCOT Operating Guides, or have been instructed to operate in CFC mode, may be considered for additional compensation utilizing the formula in Section 6.6.9.1. If the Resource Settlement Point Price at the Resource Node is lower than the Energy Offer Curve price, capped per the MOC pursuant to Section 4.4.9.4.1, at the Emergency Base Point during the CFC period, ERCOT shall pay the QSE additional compensation for the amount of energy from a zero Base Point to the Emergency Base Point for each Resource that provided CFC. Compensation for a CFC test will not be provided if the test was a retest requested by the QSE. For the purpose of this Settlement, and limited to Settlement Intervals inclusive of the CFC period, the Emergency Base Point shall be set to the Average Telemetered Generation for the 5 Minutes (AVGTG5M). Only Resources that moved in the direction to correct frequency are eligible to receive compensation for providing CFC.

(9) If Emergency Base Points or SCED Base Points are unavailable, corrupted or otherwise unusable for Settlement purposes due to system conditions, hardware failure, or software failure, the Real-Time Metered Generation (RTMG) will be used to create proxy Base Points pursuant to Section 6.6.9.1. If the RTMG is not available the most accurate available generation data as determined by ERCOT will be used to create proxy Base Points pursuant to Section 6.6.9.1. ERCOT shall issue a Market Notice stating the Operating Day and Settlement Intervals that were impacted and the generation data that was used to create proxy Base Points.

[NPRR1010 and NPRR1014: Replace applicable portions of Section 6.6.9 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation for NPRR1014:]

6.6.9 Emergency Operations Settlement

(1) Due to Emergency Conditions or Watches, additional compensation for each Generation Resource or Energy Storage Resource (ESR) for which ERCOT provides an Emergency Base Point may be awarded to the QSE representing the Generation Resource or ESR. If the Resource was instructed to increase generation at a Settlement Point price that is lower than the price based on their Energy Offer Curve or Energy Bid/Offer Curve, or if the Resource was instructed to increase withdrawal at a Settlement Point price that is higher than the price based on their Energy Bid/Offer Curve, ERCOT shall pay the QSE additional compensation for the change from the SCED Base Point immediately before the Emergency Condition or Watch, per paragraph (1) in Section 6.6.9.1, Payment for Emergency Operations Settlement. The Energy Offer Curve and Energy/Bid Offer Curve shall be capped by the Mitigated Offer Cap (MOC).

(2) In accordance with paragraph (8) of Section 8.1.1.2, General Capacity Testing Requirements, QSEs that receive a VDI to operate the designated Generation Resource for an unannounced Generation Resource test may be considered for additional compensation utilizing the formula as stated in paragraph (1) in Section 6.6.9.1. If the test period SCED Base Point is higher than the SCED Base Point immediately before the test period and the Settlement Point Price at the Resource Node is lower than the Generation Resource's Energy Offer Curve price, or MOC if no offer exists, at the test Base Point, and the test was not a retest requested by the QSE, ERCOT shall pay the QSE additional compensation for the additional energy above the pre-test SCED Base Point. For the purpose of this Settlement, and limited to Settlement Intervals inclusive of the unannounced Generation Resource test, SCED Base Points will be used in place of the Emergency Base Point.

(3) A QSE that represents a QSGR that comes On-Line as a result of a Base Point greater than zero shall be considered for additional compensation using the formula in paragraph (2) in Section 6.6.9.1 when the Base Point is less than or equal to its applicable Seasonal net minimum sustainable rating provided in the Resource Registration data. For the 15-minute Settlement Interval, the process for additional compensation compares the Resource's energy and Ancillary Services revenue with the Resource's revenue target, as defined in Section 6.6.9.1, considering both Ancillary Service awards and Base Points, where the Energy Offer Curve is capped per the MOC. For the purpose of this Settlement, inclusive of the first Settlement Interval in which the QSGR is deployed by SCED from a current SCED Base Point equal to zero MW to a Base Point greater than zero, SCED Base Points will be used in place of the Emergency Base Point. The compensation specified in this paragraph continues over all applicable Intervals until SCED no longer needs the QSGR to generate energy pursuant to Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process, and there is no manual Low Dispatch Limit (LDL) override in place on the QSGR.

(4) QSEs that received Base Points that are inconsistent with Real-Time Settlement Point Prices and QSEs that receive a manual override from the ERCOT Operator shall be considered for additional compensation using the formula in paragraph (2) in Section 6.6.9.1. For the 15-minute Settlement Interval, the process for additional compensation compares the Resource's energy and Ancillary Services revenue with the Resource's revenue target, as defined in Section 6.6.9.1, considering both the Ancillary Service awards and held Base Points, where the Energy Offer Curve or the Energy Bid/Offer Curve is capped per the MOC. The held Base Point is the Base Point that the QSE received due to a manual override by ERCOT Operator or the Base Point received by the QSE that ERCOT identified as inconsistent with Real-Time Settlement Point Prices. For the purpose of this Settlement, and limited to the held Settlement Intervals inclusive of the manual override or Base Points identified as inconsistent with prices, SCED Base Points will be used in place of the Emergency Base Point.

(5) In accordance with Section 6.3, Adjustment Period and Real-Time Operations Timeline, if ERCOT sets any SCED interval as failed, then QSEs shall be considered for additional compensation using the formula in paragraph (1) in Section 6.6.9.1. For the purpose of this Settlement, and limited to the failed SCED interval, SCED Base Points will be used in place of the Emergency Base Point.

(6) For each 15-minute Settlement Interval, a QSGR that receives a manual override from the ERCOT Operator shall only be considered for compensation under paragraph (4) above.

(7) For a QSGR, the MOC curve used to cap the Energy Offer Curve shall not include the variable Operations and Maintenance (O&M) adjustment cost to start the Resource from first fire to LSL, including the startup fuel described in paragraph (1)(d) of Section 4.4.9.4.1 for all emergency operations Settlement calculations with the exception of paragraph (3) above.

(8) Any QSE that receives a VDI to operate its Resource for an unannounced CFC test, as described in the ERCOT Operating Guides, or that has been instructed to operate in CFC mode, may be considered for additional compensation utilizing the formula in paragraph (1) in Section 6.6.9.1. If the Resource increased generation at a Settlement Point Price that is lower than the price based on the Energy Offer Curve or Energy Bid/Offer Curve, or if the Resource was instructed to increase withdrawal at a Settlement Point Price that is higher than the price based on its Energy Bid/Offer Curve, ERCOT shall pay the QSE additional compensation for the amount of energy from a zero Base Point to the Emergency Base Point for each Resource that provided CFC. Compensation for a CFC test will not be provided if the test was a retest requested by the QSE. For the purpose of this Settlement, and limited to Settlement Intervals inclusive of the CFC period, the Emergency Base Point shall be set to the Average Telemetered Generation for the 5 Minutes (AVGTG5M) and the Energy Offer Curve and Energy/Bid Offer Curve shall be capped by the MOC. Only Resources that moved in the direction to correct frequency are eligible to receive compensation for providing CFC.

(9) If Emergency Base Points or SCED Base Points are unavailable, corrupted or otherwise unusable for Settlement purposes due to system conditions, hardware failure, or software failure, the Real-Time Metered Generation (RTMG) and Real-Time Charging Load (RTCL) will be used to create proxy Base Points pursuant to Section 6.6.9.1. If the RTMG and RTCL are not available, the most accurate available generation and withdrawal data as determined by ERCOT will be used to create proxy Base Points pursuant to Section 6.6.9.1. ERCOT shall issue a Market Notice stating the Operating Day and Settlement Intervals that were impacted and the ~~generation~~ data that was used to create proxy Base Points.

(10) The Energy Offer Curve or Energy Bid/Offer Curve used to calculate the Emergency Base Point Price (EBPPR) will be the Energy Offer Curve or Energy Bid/Offer Curve that was submitted by the QSE and effective for the applicable Operating Hour at the time of the triggering event that led to emergency Settlement consideration, except

when the QSE has received Base Points that are inconsistent with Real-Time Settlement Point Prices, as described in paragraph (4) above. In the case of the condition described in paragraph (3) above, the triggering event would be the first interval in which the QSGR comes On-Line as a result of a Base Point greater than zero.

(11) For ESRs that qualify for emergency Settlement, for purposes of this section, the MOC curve used to cap the Energy Bid/Offer Curve shall be set to the highest Real-Time Settlement Point Price (RTSPP) at the Resource's Settlement Point for the Operating Day.

8.1 QSE and Resource Performance Monitoring

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

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

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

(a) Real-Time data, for QSEs:

(i) Telemetry performance

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

(c) Hydro responsive testing for Generation Resources;

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

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

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

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

(h) Resource-specific ERCOT Contingency Reserve Service (ECRS) performance for QSEs and Resources;

(i) Outage reporting, by QSEs for Resources;

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

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

8.1.1.1 Ancillary Service Qualification and Testing

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

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

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

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

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

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

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

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

period, the Generation Resource Energy Deployment Performance (GREDP) calculated in accordance with Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource Energy Deployment Performance, and Ancillary Service Capacity Performance Metrics, will not apply.

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

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

(a) The Resource's Responsibility for ECRS and RRS; or

(b) The requested MW deployment.

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

(9) ERCOT may revoke the Ancillary Service qualification of any Load Resource, excluding Controllable Load Resources, for failure to comply with the required performance standards, based on the evaluation it performed under paragraph (4) of Section 8.1.1.4.2, Responsive Reserve Service Energy Deployment Criteria, or under paragraph (1)(b) of Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment. Specifically, if a Load Resource that is providing RRS or ECRS fails to respond with at least 95% of its Ancillary Service Resource Responsibility for RRS or ECRS within ten minutes of an ERCOT Dispatch Instruction, that response shall be considered a failure. Two Load Resource performance failures, either in a deployment event or a Load interruption test, within any rolling 365-day period shall result in disqualification of that Load Resource. After six months of disqualification, the Load Resource may reapply for qualification provided it submits a corrective action plan to ERCOT that identifies actions

taken to correct performance deficiencies and the disqualified Load Resource successfully passes a new Load interruption test as specified in this Section 8.1.1.1.

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

(a) The Resource's Ancillary Service Resource Responsibility for RRS; or

(b) The MW deployment.

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

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

[NPRR963, NPRR1011, and NPRR1188: Replace applicable portions of Section 8.1.1.1 above with the following upon system implementation for NPRR963 or NPRR1188; or upon system implementation of Real-Time Co-Optimization (RTC) project for NPRR1011:]

8.1.1.1 Ancillary Service Qualification and Testing

(1) Each QSE and the Resource providing Ancillary Service must meet qualification criteria to operate satisfactorily with ERCOT. ERCOT shall use the Ancillary Service qualification and testing program that is approved by TAC and included in the

Operating Guides. Each QSE for the Resources that it represents may only provide Ancillary Services on those Resources for which it has met the qualification criteria.

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

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

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

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

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

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

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

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

(8) To maintain qualification with ERCOT to provide RRS or ECRS service, each Load Resource, excluding Controllable Load Resources (CLRs), will be subject to a Load interruption test at a date and time determined by ERCOT and known only to ERCOT and the affected Transmission Service Provider (TSP), to verify the ability to respond to an ERCOT Dispatch Instruction. To successfully pass this test, within ten minutes

of the receipt of the ERCOT Dispatch Instruction by the Load Resource's QSE, the Load Resource's response shall not be less than 95% of the requested MW deployment, nor more than 150% of the lesser of the following:

(a) The Resource's ECRS and RRS awards, or

(b) The requested MW deployment.

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

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

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

(a) The Resource's RRS award; or

(b) The MW deployment.

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

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

8.1.1.2.1.7 ERCOT Contingency Reserve Service Qualification

(1) ECRS may be provided by:

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

(b) Quick Start Generation Resources (QSGRs);

(c) Load Resources that may or may not be controlled by high-set under-frequency relays;

(d) Generation Resources operating in the synchronous condenser fast-response mode; or

(e) Controllable Load Resources.

(2) The amount of ECRS provided by individual Generation Resources and Load Resources is limited to ten times its telemetered emergency ramp rate. Each Resource providing ECRS must be capable of ramping the Resource's Ancillary Service Resources Responsibility for ECRS within ten minutes of the notice to deploy ECRS, and must be able to maintain the scheduled level of deployment for the period of service commitment. The amount of ECRS on a Generation Resource may be further limited by requirements of the Operating Guides.

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

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

(5) Load Resources providing ECRS must provide a telemetered output signal, including breaker status and status of the under-frequency relay, if applicable.

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

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

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

(b) For Generation Resources desiring qualification to provide ECRS, ERCOT shall send a signal to the Resource's QSE to deploy ECRS, indicating the MW amount. ERCOT shall monitor the QSEs telemetry of the Resource's Ancillary Service Schedule for an update within 15 seconds. ERCOT shall measure the test Resource's response as described under Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria. ERCOT shall evaluate the response of the Generation Resource given the current operating conditions of the system and determine the Resource's qualification to provide ECRS.

(c) For Controllable Load Resources desiring qualification to provide ECRS, ERCOT shall send a signal to the Resource's QSE to deploy ECRS, indicating the MW amount. ERCOT shall measure the test Resource's response as described under Section 8.1.1.4.4. ERCOT shall evaluate the response of the Controllable Load Resource given the current operating conditions of the system and determine the Controllable Load Resource's qualification to provide ECRS.

(d) For Load Resources, excluding Controllable Load Resources, desiring qualification to provide ECRS, ERCOT shall deploy ECRS, indicating the MW amount. ERCOT shall measure the test Resource's response as described under Section 8.1.1.4.4.

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

[NPRR1011: Replace Section 8.1.1.2.1.7 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

8.1.1.2.1.7 ERCOT Contingency Reserve Service Qualification

(1) ECRS may be provided by:

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

(b) Quick Start Generation Resources (QSGRs);

(c) Load Resources that may or may not be controlled by high-set under-frequency relays;

(d) Generation Resources operating in the synchronous condenser fast-response mode; ~~or~~

(e) Controllable Load Resources; or

(f) ESRs.

(2) All Resources qualified to participate in SCED or qualified to telemeter a Resource Status of ONSC are also qualified to provide ECRS when the Resource is On-Line. The amount of ECRS for which the Resource is qualified when On-Line will be limited to the amount of capacity that can be ramped or unloaded within ten minutes. Off-Line ECRS can only be provided by qualified QSGRs.

(3) The amount of ECRS provided by individual Generation Resources and Load Resources is limited to ten times its telemetered emergency ramp rate. Each Resource providing ECRS must be capable of ramping the Resource's Ancillary Service award for ECRS within ten minutes of the notice to deploy ECRS, and must be able to maintain the awarded level of deployment for at least one hour. The amount of ECRS on a Generation Resource may be further limited by requirements of the Operating Guides.

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

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

(6) Load Resources providing ECRS must provide a telemetered output signal, including breaker status and status of the under-frequency relay, if applicable.

(7) Each QSE shall ensure that each Resource is able to meet the Resource's obligations to provide the Ancillary Service award. Each Generation Resource and Load Resource providing ECRS when Off-Line as a QSGR with an OFFQS Resource Status, or when not qualified to participate in SCED, must meet additional technical requirements specified in this Section.

(8) A qualification test for each Resource to provide ECRS when Off-Line as a QSGR with an OFFQS Resource Status or as a Load Resource, excluding Controllable Load Resources, is conducted during a continuous eight-hour period agreed to by the QSE and ERCOT. ERCOT shall confirm the date and time of the test with the QSE. ERCOT shall administer the following test requirements:

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

(b) Generation Resources desiring qualification to provide ECRS when Off-Line must meet the QSGR qualification criteria outlined under Section 8.1.1.2, General Capacity Testing Requirements. ERCOT shall measure the test Resource's response as described under Section 8.1.1.2 for QSGR. ERCOT shall evaluate the response of the Generation Resource given the current operating conditions of the system and determine the Resource's qualification to provide ECRS.

(c) For Load Resources, excluding Controllable Load Resources, desiring qualification to provide ECRS, ERCOT shall deploy ECRS, indicating the MW amount. ERCOT shall measure the test Resource's response as described under Section 8.1.1.4.4.

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

8.1.1.4.1 Regulation Service and Generation Resource/Controllable Load Resource Energy Deployment Performance, and Ancillary Service Capacity Performance Metrics

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

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

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

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

Where:

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

ARI = Average Regulation Instruction = the amount of regulation that the Generation Resource or IRR Group should have produced based on the LFC deployment signals, calculated by LFC, during each five-minute clock interval

Δfrequency is actual frequency minus 60 Hz

EPFR = Estimated Primary Frequency Response (MW) = if $|\Delta\text{frequency}| \leq$ Governor Dead-Band then EPFR = zero, if not then if Δfrequency > zero, EPFR = (Δfrequency - Governor Dead-Band)/((droop value * 60) – Governor Dead-Band) * HSL * -1, if not then if Δfrequency < zero, EPFR = (Δfrequency + Governor Dead-Band)/((droop value * 60) – Governor Dead-Band) * HSL * -1

AEPFR = Average Estimated Primary Frequency Response = the Estimated Primary Frequency Response (MW) will be calculated every four seconds using a Resource specific droop value where 5% droop = 0.05 the Governor Dead-Band (Hz) and Resource HSL (MW) provided by the Resource Entity, and the frequency deviation (Hz) from 60 Hz and averaged for the five-minute clock interval. For Combined Cycle Generation Resources, or Generation Resources that have been approved to telemeter Non-Frequency Responsive Capacity (NFRC), the HSL will be reduced by the telemetered NFRC MW to calculate the EPFR. For Combined Cycle Generation Resources, 5.78% Governor droop shall be used. The Resource-specific calculations will be aggregated for IRR Groups.

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

ramp period, the linearly ramped Base Point will continue at a constant value equal to the ending four-second value of the five-minute ramp.

(3) For all of a QSE's Resources that have a Resource Status of ONDSR or ONDSRREG ("Dynamically Scheduled Resource (DSR) Portfolio"), ERCOT shall calculate an aggregate GREDP as a percentage and in MWs for those Resources as follows:

GREDP (%) = ABS[($\sum_{DSR}$ ATG – $\sum_{DSR}$ DBPOS + Intra-QSE Purchase – Intra-QSE Sale – ARRDDSRLR – AECRDDSRLR – ANSDDSRLR – $\sum_{DSR}$ AEPFR) / (ATDSRL + $\sum_{DSR}$ ARI) – 1.0] * 100

GREDP (MW) = ABS($\sum_{DSR}$ ATG – $\sum_{DSR}$ DBPOS – ATDSRL– ARRDDSRLR – AECRDDSRLR – ANSDDSRLR + Intra-QSE Purchase - Intra-QSE Sale – $\sum_{DSR}$ AEPFR – $\sum_{DSR}$ ARI)

Where:

$\sum_{DSR}$ ATG = Sum of Average Telemetered Generation for all Resources with a Resource Status of ONDSR or ONDSRREG of the QSE for the five-minute clock interval

$\sum_{DSR}$ ARI = Sum of Average Regulation Instruction for all Resources with a Resource Status of ONDSR or ONDSRREG of the QSE for the five-minute clock interval

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

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

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

$\sum_{DSR}$ AEPFR = Sum of Average Estimated Primary Frequency Response for all Resources with a Resource Status of ONDSR or ONDSRREG of the QSE for the five-minute clock interval

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

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

AECRDDSRLR = Average ERCOT Contingency Response Deployment DSR Load Resource = the average ECRS energy deployment for the five-minute clock interval from Load Resources that are part of the DSR Load

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

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

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

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

Where:

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

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

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

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

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

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

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

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

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

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

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

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

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

the DSR Portfolio was released to SCED that the GREDP was greater than 5.0 MW;

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

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

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

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

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

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

(o) The percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was providing Regulation Service that the CLREDP

was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the Controllable Load Resource was providing Regulation Service that the CLREDP was greater than 5.0 MW.

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

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

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

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

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

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

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

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

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

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

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

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

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

(j) For intervals where both the primary and backup Wide Area Network (WAN) connections are inoperative.

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

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

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

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

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

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

(a) An IRR or IRR Group must have a GREDP less than Z% or the ATG must be less than the expected MW output for 95% of the five-minute clock intervals in the month when the Resource or a member IRR of an IRR Group received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the IRR's HSL used by SCED or the IRR was instructed not to exceed its Base Point. The expected MW output includes the Resource's Base Point, Regulation Service instructions, and any expected Primary Frequency Response.

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

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

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

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

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

(i) A Controllable Load Resource must have a CLREDP less than the greater of X% or Y MW. A Controllable Load Resource cannot fail this criteria more than three five-minute clock intervals during which EEA was

declared and CLREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA.

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

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

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

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

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

(10) The GREDP/CLREDP performance criteria in paragraphs (7) through (9) above shall be subject to review and approval by TAC. The GREDP/CLREDP performance criteria variables X, Y, and Z shall be posted to the ERCOT website no later than three Business Days after TAC approval.

(11) If at the end of the month during which GREDP was calculated, a non-DSR Resource or a QSE with DSR Resources, has a GREDP less than X% or Y MW for 85% of the five-minute clock intervals, the Reliability Monitor shall, at the request of the QSE, recalculate GREDP excluding the five-minute clock intervals when a Resource is deployed above the unit's ramp rate due to ramp rate sharing between energy and Regulation Service, as described in Section 6.5.7.2, Resource Limit Calculator. The requesting QSE shall provide to the Reliability Monitor information validating the ramp rate violation for the intervals in dispute.

[NPRR879, NPRR963, NPRR965, NPRR1000, NPRR1046, NPRR1011, NPRR1014, and NPRR1029: Replace applicable portions of Section 8.1.1.4.1 above with the following upon system implementation for NPRR879, NPRR963, NPRR965, NPRR1000, NPRR1014, or NPRR1029; upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1011; or upon system implementation of NPRR1000 for NPRR1000 and NPRR1046:]

8.1.1.4.1 Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance, and Ancillary Service Capacity Performance Metrics

(1) ERCOT shall compute the GREDP for each Generation Resource that is On-Line and released to SCED for Base Point Dispatch Instructions. The GREDP is calculated for each five-minute clock interval as a percentage and in MWs as follows:

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

GREDP (MW) = ABS(ATG – AEPFR – ASP)

Where:

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

Δfrequency is actual frequency minus 60 Hz

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

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

ASP = Average Set Point = the time-weighted average of the Resource's Updated Desired Set Point (UDSP) for the five-minute clock interval

(2) For Controllable Load Resources that have a Resource Status of ONL and are acting as a Controllable Load Resource ~~and are not part of an ESR~~, ERCOT shall compute the CLREDP. The CLREDP will be calculated both as a percentage and in MWs as follows:

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

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

Where:

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

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

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

(3) ERCOT shall compute the ESREDP for ESRs. The ESREDP is calculated for each five-minute clock interval as a percentage and in MWs as follows:

ESREDP (%) = ABS[((ATPF – AEPFR)/(ASP)) – 1.0] * 100

ESREDP (MW) = ABS(ATPF – AEPFR – ASP)

Where:

ATPF = Average Telemetered Power Flow = the average telemetered power flow of the Energy Storage Resource for the five-minute clock interval.

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

Δfrequency is actual frequency minus 60 Hz.

EPFR = Estimated Primary Frequency Response (MW) = If $|\Delta\text{frequency}| \leq$ Governor Dead-Band then EPFR = zero, if not then if Δfrequency > zero, EPFR = (Δfrequency - Governor Dead-Band)/((droop value * 60) – Governor Dead-Band) * ABS(HSL-LSL) * -1, if not then if Δfrequency < zero, EPFR = (Δfrequency + Governor Dead-Band)/((droop value * 60) – Governor Dead-Band) * ABS(HSL-LSL) * -1.

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

(4) ERCOT shall post to the MIS Certified Area for each QSE and for all Generation Resources, ESRs, ~~or~~ Wind-powered Generation Resource (WGR) Groups, and ~~for all~~ Controllable Load Resources, as applicable:

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

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

(c) The percentage of the monthly five-minute clock intervals during which the ESR had a Resource Status of ON;

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

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

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

(g) The percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESRESDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESRESDP was less than 2.5 MW;

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

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

(j) The percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute

clock intervals during which the ESR was released to SCED that the ESREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;

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

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

(m) The percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was released to SCED that the ESREDP was greater than 5.0 MW;

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

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

(p) The percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was less than 2.5% and the percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was less than 2.5 MW;

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

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

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

(s) The percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was equal to or greater than 2.5% and equal to or less than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was equal to or greater than 2.5 MW and equal to or less than 5.0 MW;

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

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

(v) The percent of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was greater than 5.0% and the percentage of the monthly five-minute clock intervals during which the ESR was awarded Regulation Service that the ESREDP was greater than 5.0 MW.

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

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

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

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

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

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

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

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

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

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

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

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

(i) For intervals where both the primary and backup Wide Area Network (WAN) connections are inoperative; and

(j) For QSGRs, the five-minute clock intervals in which the QSGR has a telemetered status of SHUTDOWN or telemeters an LSL of zero pursuant to Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process.

(6) All Generation Resources ~~that are not part of an ESR~~, excluding IRRs, shall meet the following GREDP criteria for each month. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor.

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

(b) Additionally, all Generation Resources, excluding IRRs, will also be measured for performance specifically during intervals in which ERCOT has declared EEA Level 1 or greater. These Resources must meet the following GREDP criteria for the time window that includes all five-minute clock intervals during

which EEA was declared. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:

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

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

(a) An IRR or IRR Group must have a GREDP less than Z% or the ATG must be less than the expected MW output for 95% of the five-minute clock intervals in the month when the Resource or a member IRR of an IRR Group was not awarded Ancillary Service and received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the IRR's HSL used by SCED or the IRR was instructed not to exceed its Base Point. The expected MW output includes the Resource's Base Point, Regulation Service instructions, and any expected Primary Frequency Response.

(b) An IRR or IRR Group must have a GREDP less than the greater of X% or Y MW for 85% of the five-minute clock intervals in the month during which the Resource or a member IRR of an IRR Group was awarded Ancillary Service.

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

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

(ii) An IRR or IRR Group must have a GREDP less than the greater of X% or Y MW when the Resource or a member IRR of an IRR Group was awarded Ancillary Service. An IRR or IRR Group cannot fail this

criteria more than three five-minute clock intervals during which EEA was declared. The performance will be measured separately for each instance in which ERCOT has declared EEA.

(8) All Controllable Load Resources ~~that are not part of an ESR~~ shall meet the following CLREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:

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

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

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

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

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

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

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

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

(9) All ESRs shall meet the following ESREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:

(a) An ESR must have an ESREDP less than the greater of V% or W MW for 85% of the five-minute clock intervals in the month during which ESREDP was calculated.

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

(i) An ESR must have an ESREDP less than the greater of V% or W MW. An ESR cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and ESREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA.

(10) DC-Coupled Resources shall meet the following ESREDP criteria each month. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:

(a) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (1) of Section 3.8.7, DC-Coupled Resources, the DC-Coupled Resource must have an ESREDP less than the greater of V% or W MW for 85% of the five-minute clock intervals in the month during which ESREDP for the DC-Coupled Resource was calculated.

(b) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (2) of Section 3.8.7, the DC-Coupled Resource must have an ESREDP less than Z% or the ATG must be less than the expected MW output for 95% of the five-minute clock intervals in the month when the DC-Coupled Resource received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the DC-Coupled Resource's HSL used by SCED or the IRR was instructed not to exceed its Base Point. The expected MW output includes the Resource's Base Point and any expected Primary Frequency Response.

(c) Additionally, all DC-Coupled Resources will be measured for performance during intervals in which ERCOT has declared an EEA. These Resources must meet the following ESREDP criteria for the time window that includes all five-minute clock intervals during which the EEA was declared. ERCOT will report non-compliance of the following performance criteria to the Reliability Monitor:

(i) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (1) of Section 3.8.7, the DC-Coupled Resource must have an ESREDP less than the greater of V% or W MW.

A DC-Coupled Resource cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and ESREDP was calculated. The performance will be measured separately for each instance in which ERCOT has declared EEA.

(ii) For each five-minute clock interval in which a DC-Coupled Resource meets the conditions in paragraph (2) of Section 3.8.7, the DC-Coupled Resource must have a ESREDP less than Z% or the ATG must be less than the expected MW output. A DC-Coupled Resource cannot fail this criteria more than three five-minute clock intervals during which EEA was declared and the DC-Coupled Resource received a Base Point Dispatch Instruction in which the Base Point was two MW or more below the DC-Coupled Resource's HSL used by SCED or the IRR was instructed not to exceed its Base Point. The performance will be measured separately for each instance in which ERCOT has declared EEA.

(11) The GREDP/CLREDP/ESREDP performance criteria in paragraphs (6) through (10) above shall be subject to review and approval by TAC. The GREDP/CLREDP/ESREDP performance criteria variables V, W, X, Y, and Z shall be posted to the ERCOT website no later than three Business Days after TAC approval.

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

8.2 ERCOT Performance Monitoring

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

(a) Coordinating the wholesale electric market transactions;

(b) System-wide transmission planning; and

(c) Network reliability.

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

(a) Transmission control:

(i) Transmission system availability statistics;

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

(iii) Metrics describing performance of the State Estimator;

(b) Resource control:

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

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

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

(iv) Metrics describing conflicting instructions to Generation Resources and Energy Storage Resources (ESRs) from interval to interval;

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

(vi) Voltage and reactive control performance;

(c) Settlement stability:

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

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

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

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

(v) Other Settlement metrics; and

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

(d) Performance in implementing network model updates;

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

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

(g) Net Allocation to Load:

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

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

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

8.4 ERCOT Response to Market Non-Performance

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

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

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

9.17.1 Billing Determinant Data Elements

(1) ERCOT shall calculate and provide to Market Participants on the ERCOT website the following data elements annually to be used by TSPs and DSPs as billing determinants for transmission access service. This data must be provided by December 1 of each year. This calculation must be made under the requirements of P.U.C. SUBST. R. 25.192, Transmission Service Rates. ERCOT shall use the most recent aggregate data produced by the ERCOT Settlement system to perform these calculations.

(a) The 4-Coincident Peak (4-CP) for each DSP and External Load Serving Entity (ELSE), as applicable;

(b) The ERCOT average 4-CP;

(c) The average 4-CP for each DSP and ELSE, as applicable, coincident to the ERCOT average 4-CP.

(2) ERCOT average 4-CP is defined as the average of the coincidental MW peaks occurring during the months of June, July, August, and September.

(3) Coincidental MW peak is defined as the highest monthly Settlement Interval 15-minute MW peak for the entire ERCOT Transmission Grid as calculated per the following formula: The sum of all net energy produced by Generation Resources + Energy Storage Resources (ESRs) + Settlement Only Generators (SOGs) + Block Load Transfers (BLTs) from ERCOT to another Control Area that have been registered for Settlement purposes + actual Direct Current Tie (DC Tie) imports - BLTs to ERCOT from another Control Area that are not reflected in a Non-Opt-In Entity's (NOIE's) Load - actual DC Tie exports - Wholesale Storage Load (WSL).

[NPRR995: Replace paragraph (3) above with the following upon system implementation:]

(3) Coincidental MW peak is defined as the highest monthly Settlement Interval 15-minute MW peak for the entire ERCOT Transmission Grid as calculated per the following formula: The sum of all net energy produced by Generation Resources + Settlement Only Generators (SOGs) + Settlement Only Energy Storage Systems (SOESSs) + Block Load Transfers (BLTs) from ERCOT to another Control Area that have been registered for Settlement purposes + actual Direct Current Tie (DC Tie) imports - BLTs to ERCOT from another Control Area that are not reflected in a Non-Opt-In Entity's (NOIE's) Load - actual DC Tie exports - Wholesale Storage Load (WSL).

(4) Any difference between the coincidental MW peak (converted to MWh) and the ERCOT Settlement volumes, excluding DC Tie exports, BLTs to ERCOT from another Control Area that are not reflected in a NOIE's Load, and WSL, shall be allocated amongst all DSPs and ELSEs that are included in the ERCOT 4-CP Report on a pro rata basis as per the formula below:

$$\mathbf{LTDSP_4CP}_{tdsp} = (\mathbf{PLTDSP4CPLRS}_{tdsp} * \mathbf{NLADJ}) + \mathbf{PLTDSP4CP}_{tdsp}$$

The above variables are defined as follows:

Variable	Unit	Definition
LTDSP_4CP $_{tdsp}$	MWh	*Load by TDSP for 4-CP* - The load for each DSP and ELSE coincident to the coincidental MW peak adjusted for NLADJ
PLTDSP4CPLRS $_{tdsp}$	%	*Preliminary Load by TDSP for 4-CP Load Ratio Share* - The Load Ratio Share (LRS) for each DSP and ELSE coincident to the coincidental MW peak prior to adjusting for NLADJ

Variable	Unit	Definition
NLADJ	MWh	*Native Load Adjustment* - The difference between the coincidental MW peak (converted to MWh) and the ERCOT settlement volumes, excluding DC Tie exports, BLTs to ERCOT from another Control Area that are not reflected in a NOIE's Load, and WSL
PLTDSP4CP $_{tdsp}$	MWh	*Preliminary Load by TDSP for 4CP* - The Load for each DSP and ELSE coincident to the coincidental MW peak prior to adjusting for NLADJ
tdsp	None	A DSP or ELSE

9.19.1 Default Uplift Invoices

(1) ERCOT shall collect the total short-pay amount for all Settlement Invoices for a month, less the total payments expected from a payment plan, from Qualified Scheduling Entities (QSEs) and CRR Account Holders. ERCOT must pay the funds it collects from payments on Default Uplift Invoices to the Entities previously short-paid. ERCOT shall notify those Entities of the details of the payment.

(2) Each Counter-Party's share of the uplift is calculated using the best available Settlement data for each Operating Day in the month prior to the month in which the default occurred (the "reference month"), and is calculated as follows:

$$\mathbf{DURSCP_{cp} = TSPA * MMARS_{cp}}$$

Where:

$$MMARS_{cp} = MMA_{cp} / MMATOT$$

$$MMA_{cp} = \text{Max} \{ \sum_{mp} (URTMG_{mp} + URTDCIMP_{mp} + USOGTOT_{mp}),$$

$$\sum_{mp} (URTAML_{mp} + UWSLTOT_{mp}),$$

$$\sum_{mp} URTQQES_{mp},$$

$$\sum_{mp} URTQQEP_{mp},$$

$$\sum_{mp} UDAES_{mp},$$

$$\sum_{mp} UDAEP_{mp},$$

$$\sum_{mp} (URTOBL_{mp} + URTOBLLO_{mp}),$$

$$\sum_{mp} (UDAOPT_{mp} + UDAOBL_{mp} + UOPTS_{mp} + UOBLS_{mp}),$$

$$\sum_{mp} (UOPTP_{mp} + UOBLP_{mp}) \}$$

[NPRR995, NPRR1012, and NPRR1201: Replace applicable portions of the formula "MMA_{cp}" above with the following upon system implementation for NPRR995 or NPRR1201; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1012:]

$$MMA_{cp} = \text{Max}\{ \sum_{mp} (URTMG_{mp} + URTDCIMP_{mp} + USOGTOT_{mp}),$$
$$\sum_{mp} (URTAML_{mp} + UWSLTOT_{mp} + USOCLTOT_{mp}),$$
$$\sum_{mp} URTQQES_{mp},$$
$$\sum_{mp} URTQQEP_{mp},$$
$$\sum_{mp} UDAES_{mp},$$
$$\sum_{mp} UDAEP_{mp},$$
$$\sum_{mp} (URTOBL_{mp} + URTOBLLO_{mp}),$$
$$\sum_{mp} (UDAOPT_{mp} + UDAOBL_{mp}),$$
$$\sum_{mp} UDAASOAWD_{mp}\}$$

$$MMATOT = \sum_{cp} (MMA_{cp})$$

Where:

$URTMG_{mp} = \sum_{p, r, i} (RTMG_{mp, p, r, i})$, excluding RTMG for RMR Resources and RTMG in Reliability Unit Commitment (RUC)-Committed Intervals for RUC-committed Resources

$URTDCIMP_{mp} = \sum_{p, i} (RTDCIMP_{mp, p, i}) / 4$

$URTAML_{mp} = \max(0, \sum_{p, i} (RTAML_{mp, p, i}))$

$URTQQES_{mp} = \sum_{p, i} (RTQQES_{mp, p, i}) / 4$

$URTQQEP_{mp} = \sum_{p, i} (RTQQEP_{mp, p, i}) / 4$

$UDAES_{mp} = \sum_{p, h} (DAES_{mp, p, h})$

$UDAEP_{mp} = \sum_{p, h} (DAEP_{mp, p, h})$

$URTOBL_{mp} = \sum_{(j, k), h} (RTOBL_{mp, (j, k), h})$

$URTOBLLO_{mp} = \sum_{(j, k), h} (RTOBLLO_{mp, (j, k), h})$

$UDAOPT_{mp} = \sum_{(j, k), h} (DAOPT_{mp, (j, k), h})$

$$UDAOBL_{mp} = \sum_{(j,k),h} (DAOBL_{mp,(j,k),h})$$

$$UOPTS_{mp} = \sum_{(j,k),h} (OPTS_{mp,(j,k),h})$$

$$UOBLS_{mp} = \sum_{(i,k),h} (OBLS_{mp,(i,k),h})$$

$$UOPTP_{mp} = \sum_{(i,k),h} (OPTP_{mp,i,h})$$

$$UOBLP_{mp} = \sum_{(j,k),h} (OBLP_{mp,(j,k),h})$$

[NPRR1201: Delete the formulas "$UOPTS_{mp}$", "$UOBLS_{mp}$", "$UOPTP_{mp}$", and "$UOBLP_{mp}$" above upon system implementation.]

$$UWSLTOT_{mp} = (-1) * \sum_{r,b} (MEBL_{mp,r,b})$$

[NPRR1012: Insert the formula "$UDAASOAWD_{mp}$" below upon system implementation of the Real-Time Co-Optimization (RTC) project:]

$$UDAASOAWD_{mp} = \sum_{h} (DARUOAWD_{mp,h} + DARDOAWD_{mp,h} + DARROAWD_{mp,h} + DANSOAWD_{mp,h} + DAECROAWD_{mp,h})$$

$$USOGTOT_{mp} = \sum_{gsc} (MEBSOGNET_{mp,gsc}) + \sum_{p,i} (RTMGSOGZ_{mp,p,i})$$

[NPRR995: Insert the formula "$USOCLTOT_{mp}$" below upon system implementation:]

$$USOCLTOT_{mp} = (-1) * \sum_{gsc,h} (WSOL_{mp,gsc,h})$$

The above variables are defined as follows:

Variable	Unit	Definition
$DURSCP_{cp}$	$	*Default Uplift Ratio Share per Counter-Party* The Counter-Party's pro rata portion of the total short-pay amount for all Day-Ahead Market (DAM) and Real-Time Market (RTM) Invoices for a month.
TSPA	$	*Total Short Pay Amount*—The total short-pay amount calculated by ERCOT to be collected through the Default Uplift Invoice process.
$MMARS_{cp}$	None	*Maximum MWh Activity Ratio Share* The Counter-Party's pro rata share of Maximum MWh Activity in the reference month.
MMA_{cp}	MWh	*Maximum MWh Activity* The maximum MWh activity of all Market Participants represented by the Counter-Party in the DAM, RTM and CRR Auction in the reference month.
MMATOT	MWh	*Maximum MWh Activity Total*—The sum of all Counter-Party's Maximum MWh Activity in the reference month.

Variable	Unit	Definition
RTMG $_{mp, p, r, i}$	MWh	*Real-Time Metered Generation per Market Participant per Settlement Point per Resource* The Real-Time energy produced by the ~~Generation~~ Resource *r* represented by Market Participant *mp*, at Resource Node *p*, for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE.
URTMG $_{mp}$	MWh	*Uplift Real-Time Metered Generation per Market Participant*—The monthly sum of Real-Time energy produced by ~~Generation~~ Resources represented by Market Participant *mp*, excluding generation for RMR Resources and generation in RUC-Committed Intervals, where the Market Participant is a QSE assigned to the registered Counter-Party.
RTDCIMP $_{mp, p, i}$	MW	*Real-Time DC Import per QSE per Settlement Point* The aggregated Direct Current Tie (DC Tie) Schedule submitted by Market Participant *mp*, as an importer into the ERCOT System through DC Tie *p*, for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE.
URTDCIMP $_{mp}$	MW	*Uplift Real-Time DC Import per Market Participant* The monthly sum of the aggregated DC Tie Schedule submitted by Market Participant *mp*, as an importer into the ERCOT System where the Market Participant is a QSE assigned to a registered Counter-Party.
RTAML $_{mp, p, i}$	MWh	*Real-Time Adjusted Metered Load per Market Participant per Settlement Point*—The sum of the Adjusted Metered Load (AML) at the Electrical Buses that are included in Settlement Point *p* represented by Market Participant *mp* for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE.
URTAML $_{mp}$	MWh	*Uplift Real-Time Adjusted Metered Load per Market Participant* The monthly sum of the AML represented by Market Participant *mp*, where the Market Participant is a QSE assigned to the registered Counter-Party.
RTQQES $_{mp, p, i}$	MW	*QSE-to-QSE Energy Sale per Market Participant per Settlement Point*—The amount of MW sold by Market Participant *mp* through Energy Trades at Settlement Point *p* for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE.
URTQQES $_{mp}$	MWh	*Uplift QSE-to-QSE Energy Sale per Market Participant* The monthly sum of MW sold by Market Participant *mp* through Energy Trades, where the Market Participant is a QSE assigned to the registered Counter-Party.
RTQQEP $_{mp, p, i}$	MW	*QSE-to-QSE Energy Purchase per Market Participant per Settlement Point*—The amount of MW bought by Market Participant *mp* through Energy Trades at Settlement Point *p* for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE.
URTQQEP $_{mp}$	MWh	*Uplift QSE-to-QSE Energy Purchase per Market Participant* The monthly sum of MW bought by Market Participant *mp* through Energy Trades, where the Market Participant is a QSE assigned to the registered Counter-Party.
DAES $_{mp, p, h}$	MW	*Day-Ahead Energy Sale per Market Participant per Settlement Point per hour*—The total amount of energy represented by Market Participant *mp*'s cleared Three-Part Supply Offers in the DAM and cleared DAM Energy-Only Offers at Settlement Point *p*, for the hour *h*, where the Market Participant is a QSE.
UDAES $_{mp}$	MWh	*Uplift Day-Ahead Energy Sale per Market Participant* The monthly total of energy represented by Market Participant *mp*'s cleared Three-Part Supply Offers in the DAM and cleared DAM Energy-Only Offer Curves, where the Market Participant is a QSE assigned to the registered Counter-Party.