System elements as necessary to improve the reliability of the ERCOT System. On notice of a Watch, each QSE, TSP, and DSP shall prepare for an Emergency Condition in case conditions worsen. ERCOT may require information from QSEs representing Resources regarding the Resources' fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request. The specific information that may be requested shall be defined in the Operating Guides. QSEs representing Resources shall provide the requested information in a timely manner, as defined by ERCOT at the time of the request.

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

(5) ERCOT shall post the Watch message electronically to the ERCOT website and shall provide verbal notice via the TO Hotline and the QSE Hotline. Corrective actions identified by ERCOT must be communicated through Dispatch Instructions to all TSPs, DCTOs, DSPs and QSEs required to implement the corrective action. Each QSE shall immediately notify the Market Participants that it represents of the Watch. To minimize the effects on the ERCOT System, each TSP or DSP shall identify and prepare to implement actions, including restoration of transmission lines as appropriate and preparing for Load shedding. ERCOT may instruct DCTOs, TSPs or DSPs to reconfigure ERCOT System elements as necessary to improve the reliability of the ERCOT System. On notice of a Watch, each QSE, DCTO, TSP, and DSP shall prepare for an Emergency Condition in case conditions worsen. ERCOT may require information from QSEs representing Resources regarding the Resources' fuel capabilities. Requests for this type of information shall be for a time period of no more than seven days from the date of the request. The specific information that may be requested shall be defined in the Operating Guides. QSEs representing Resources shall provide the requested information in a timely manner, as defined by ERCOT at the time of the request.

6.5.9.3.4 Emergency Notice

(1) Emergency Notice is the communication issued by ERCOT when operating in an Emergency Condition.

(2) ERCOT shall issue an Emergency Notice for one or both of the following reasons:

(a) ERCOT cannot maintain minimum reliability standards (for reasons including fuel shortages) during the Operating Period using every Resource practicably obtainable from the market; or

(b) Immediate action cannot be taken to avoid or relieve a Transmission Element operating above its Emergency Rating.

(3) The actions ERCOT takes during an Emergency Condition depend on the nature and severity of the situation.

(4) ERCOT is considered to be in an Emergency Condition whenever ERCOT Transmission Grid status is such that a violation of security criteria, as defined in the Operating Guides, presents the threat of uncontrolled separation or cascading Outages and/or large-scale service disruption to Load (other than Load being served from a radial transmission line) and/or overload of a Transmission Element, and no timely solution is obtainable through SCED or CMPs.

(5) If the Emergency Condition is the result of a transmission problem, ERCOT shall act immediately to return the ERCOT System to a reliable condition, including instructing any QSE representing a Resource to change the Resource's output, curtailing any remaining DC Tie Load, and instructing TSPs or DSPs to drop Load. In addition, ERCOT may instruct any QSE representing an ESR to suspend ESR charging if ERCOT determines that a Load reduction by the ESR is capable of mitigating the transmission problem. An ESR co-located behind a Point of Interconnection (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.

(6) In the event that Load is curtailed or Load Resource(s) or ERS Resource(s) are deployed due to a transmission problem as described in paragraph (5) above, ERCOT shall post within one day an operations message to the ERCOT website listing the event's date, start and end time, MW quantity of Load curtailment or deployment instruction, and the substation(s) or geographic area in which the event occurred.

(7) If the Emergency Condition is the result of an Ancillary Service insufficiency, then ERCOT shall follow the EEA procedures.

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

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 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 3 any time the clock-minute average system frequency falls below 59.91 Hz for 20 consecutive minutes and 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 (5)(a) of Section 6.5.9.3.2, Advisory, 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 (5)(b) of Section 6.5.9.3.2, 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 (5)(b) of Section 6.5.9.3.2, 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.

6.5.9.4.1 General Procedures Prior to EEA Operations

(1) Prior to declaring EEA Level 1 detailed in Section 6.5.9.4.2, EEA Levels, ERCOT may perform the following operations consistent with Good Utility Practice:

(a) Provide Dispatch Instructions to QSEs for specific Resources to operate at an Emergency Base Point to maximize Resource deployment so as to increase PRC levels on other Resources;

(b) Commit specific available Resources as necessary that can respond in the timeframe of the emergency. Such commitments will be settled using the HRUC process;

(c) Start RMR Units available in the time frame of the emergency. RMR Units should be loaded to full capability;

(d) Utilize available Resources providing RRS, ECRS, and Non-Spin services as required;

(e) Instruct TSPs and DSPs or their agents to reduce Customer Load by using existing, in-service distribution voltage reduction measures if ERCOT determines that the implementation of these measures could help avoid entering into EEA and ERCOT does not expect to need to use these measures to reduce the amount of Load shedding that may be needed in EEA Level 3. 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; and

(f) ERCOT shall use the PRC and system frequency to determine the appropriate Emergency Notice and EEA levels.

(2) When PRC falls below 3,000 MW and is not projected to be recovered above 3,000 MW within 30 minutes following the deployment of Non-Spin, ERCOT may deploy available contracted ERS-10 and ERS-30 via an XML message followed by a VDI to the QSE Hotline. The ERS-10 and ERS-30 ramp periods shall begin at the completion of the VDI.

(a) ERS-10 and ERS-30 may be deployed at any time in a Settlement Interval. ERS-10 and ERS-30 may be deployed either simultaneously or separately, and in any order, at the discretion of ERCOT operators.

(b) Upon deployment, QSEs shall instruct their ERS Resources in ERS-10 and ERS-30 to perform at contracted levels consistent with the criteria described in Section 8.1.3.1.4, Event Performance Criteria for Emergency Response Service Resources, until either ERCOT releases the ERS-10 and ERS-30 deployment or the ERS-10 and ERS-30 Resources have reached their maximum deployment time.

(c) ERCOT shall notify QSEs of the release of ERS-10 and ERS-30 via an XML message followed by VDI to the QSE Hotline. The VDI shall represent the official notice of ERS-10 and ERS-30 release.

(d) Upon release, an ERS Resource shall return to a condition such that it is capable of meeting its ERS performance requirements as soon as practical, but no later than ten hours following the release.

6.5.9.4.2 EEA Levels

(1) ERCOT will declare an EEA Level 1 when PRC falls below 2,300 MW and is not projected to be recovered above 2,300 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 1,750 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;

(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 and telemetered HSLs are updated and reflect all Resource delays and limitations;

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

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

(ii) Suspend any ongoing ERCOT required Resource performance testing; and

(iii) 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 (iii) above with the following upon system implementation:]

(iii) 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 1,750 MW and is not projected to be recovered above 1,750 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 1,430 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. ERCOT shall follow this XML notification with a QSE Hotline VDI, which 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. ERCOT shall follow this XML notification with a QSE Hotline VDI, which 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. ERCOT shall follow this XML notification with a QSE Hotline VDI, which 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. ERCOT will declare an EEA Level 3 when PRC cannot be maintained above 1,430 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 will implement any measures associated with EEA Levels 1 and 2 that have not already been implemented.

(a) ERCOT may 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) ERCOT may instruct ESRs to suspend charging. For ESRs, ERCOT shall issue the suspension instruction 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) When PRC falls below 1,000 MW and is not projected to be recovered above 1,000 MW within 30 minutes, or when the clock-minute average frequency falls below 59.91 Hz for 25 consecutive minutes, ERCOT shall 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 1,000 MW of PRC within 30 minutes.

(c) TOs and TDSPs may shed Load connected to under-frequency relays pursuant to an ERCOT Load shed directive issued during EEA Level 3 so long as 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.

6.5.9.4.3 Restoration of Market Operations

(1) ERCOT shall continue the EEA until sufficient offers are received and deployed by ERCOT to eliminate the conditions requiring the EEA and normal SCED operations are restored. After restoring RRS, ERCOT shall restore curtailed DC Tie Load. Intermittent solutions of SCED do not set new LMPs until ERCOT declares that the EEA is no longer needed.

6.5.9.5 Block Load Transfers between ERCOT and Non-ERCOT Control Areas

(1) BLTs are procedures that transfer Loads normally located in the ERCOT Control Area to a non-ERCOT Control Area. Similarly, when a non-ERCOT Control Area experiences certain transmission contingencies or short-supply conditions, ERCOT may agree to the implementation of BLT procedures that transfer Loads normally located in a non-ERCOT Control Area to the ERCOT Control Area. BLTs are restricted to the following conditions:

(a) All modeled BLTs shall be implemented only with approval from ERCOT, unless a governmental order is issued requiring the use of the BLT.

(i) BLTs shall be registered with ERCOT. Such registration shall be subject to ERCOT approval.

(ii) For all BLTs, the TSP in the ERCOT Control Area responsible for implementing the BLT shall coordinate with ERCOT in the implementation and execution of BLTs to ensure the reliability of the ERCOT System is not jeopardized and to ensure sufficient generation capacity is available prior to serving additional Load.

(b) BLTs that are comprised of looped systems may be tied to the non-ERCOT Control Area's electrical system(s) through multiple interconnection points at the same time. Transfers of looped configurations are permitted only if all interconnection points are registered and netted under a single Electric Service Identifier (ESI ID) and represented by a singled TSP or DSP or netted behind the Non-Opt-In Entity (NOIE) metering points.

(c) BLTs of Load to the ERCOT Control Area are:

(i) Treated as non-competitive wholesale Load in the Load Zone containing the ERCOT breaker or switch that initiated the BLT;

(ii) Registered in accordance with Section 6.5.9.5.1, Registration and Posting of BLT Points, by the TSP in the ERCOT Control Area responsible for implementing the BLT;

(iii) Responsible for Unaccounted For Energy (UFE) allocations and Transmission Losses consistent with similarly situated NOIE metering points; and

(iv) Permitted only if the BLT will not jeopardize the reliability of the ERCOT System. Under an Emergency Notice, BLTs that have been implemented may be curtailed or terminated by ERCOT to maintain the reliability of the ERCOT System.

(d) BLTs of Load from the ERCOT Control Area are:

(i) Treated as generation and Load in the ERCOT Settlement system unless the Load is in a NOIE territory and the NOIE has opted for the Load transfer to be treated as a NOIE Load reduction by not submitting a Settlement Block Load Transfer Registration Form. BLTs may only be instructed with the permission of the affected non-ERCOT Control Area. Under an emergency condition in a non-ERCOT Control Area, BLTs that have been implemented may be curtailed or terminated by the non-ERCOT Control Area to maintain the reliability of the non-ERCOT system;

(ii) Registered in accordance with Section 6.5.9.5.1 by the TSP in the ERCOT Control Area responsible for implementing the BLT; and

(iii) Permitted only if the BLT will not jeopardize the reliability of the ERCOT System.

(e) BLTs specifically exclude transfers of Load between ERCOT and non-ERCOT Control Areas that occur behind a retail Settlement Meter.

(f) BLTs may be used in the restoration of service to Customers if the transfers will not jeopardize the reliability of the ERCOT System.

(g) For any BLT established in a TDSP area that is open to Customer Choice, the TDSP must register the BLT metering point for Settlement. For any BLT established in a NOIE territory, the NOIE may either register the BLT for Settlement or may forgo registration and have the Load transfer settled as a Load increase or reduction. As a condition for Settlement, a BLT must be registered using the Settlement Block Load Transfer Registration Form found on the ERCOT website, and each BLT metering point must use revenue quality, 15-minute Interval Data Recorder (IDR) Meters. ERCOT may impose additional metering requirements it considers necessary to ensure ERCOT System reliability and integrity.

(h) SCADA telemetry on switching devices at BLT points that are deemed necessary by ERCOT to be modeled in the Network Operations Model must be provided by the TSP registering the BLT.

6.5.9.5.1 Registration and Posting of BLT Points

(1) The necessary Market Participant registration, agreements, metering, and ERCOT Settlement systems, as applicable, must be in place before implementation of any BLT. At its sole discretion, ERCOT may exclude a BLT of ten MW or less from the Network Operations Model and associated telemetry requirements.

(2) ERCOT may require any size of BLT that has been deployed in accordance with Section 6.5.9.5.2, Scheduling and Operation of BLTs, to be in the Network Operations Model with required telemetry if ERCOT determines it is warranted due to the length of time deployed.

(3) BLTs that transfer Load from the ERCOT Control Area to a non-ERCOT Control Area are treated as generation and Load by ERCOT and assigned a Resource ID and, if in a NOIE territory, an ESI ID unless the Load is in a NOIE territory and the NOIE has not registered the BLT for Settlement pursuant to paragraph (1)(g) of Section 6.5.9.5, Block Load Transfers between ERCOT and Non-ERCOT Control Areas. The ERCOT Control Area TSP or DSP associated with the BLT Point has the responsibility for registering the BLT and the creation and maintenance of BLT Resource IDs for Settlement purposes. For any BLT that a NOIE has registered for Settlement, the NOIE shall designate NOIE metering point(s), a Resource Entity, and a QSE for Settlement purposes. For BLTs occurring on TSP or DSP systems open to Customer Choice, the non-ERCOT Control Area Entity receiving the transferred Load shall designate a registered Resource Entity and acknowledge a QSE for Settlement purposes in accordance with Section 16.5, Registration of a Resource Entity. The ERCOT Control Area TSP or DSP must complete the applicable BLT registration form. This BLT registration form along with the metering design and data documentation is the basis for establishing the ERCOT data model of the BLT and associated metering points for Settlement as applicable.

(4) BLTs that transfer Load from a non-ERCOT Control Area to the ERCOT Control Area are treated as a non-competitive wholesale Load by ERCOT and assigned an ESI ID unless the BLT is in a NOIE territory and the NOIE has not registered the BLT for Settlement. The ERCOT Control Area TSP or DSP associated with the BLT Point has the responsibility for registering the BLT and the creation and maintenance of BLT ESI IDs. Customers connected to the ERCOT System do not require an ESI ID separate from the assigned BLT ESI ID. The TSP or DSP that registers the BLT Point shall provide the ESI ID associated with the BLT to ERCOT. For BLTs occurring on NOIE TSP or DSP systems, the NOIE may designate NOIE metering point(s), an LSE, and a QSE for Settlement purposes. Load associated with NOIE BLTs that do not have an LSE or QSE for Settlement purposes will be reflected in the NOIE's 4-Coincident Peak (4-CP) calculation. For BLTs occurring on TSP or DSP systems open to Customer Choice, the non-ERCOT Control Area Entity shall designate a registered ERCOT LSE and

acknowledge a QSE for Settlement purposes in accordance with Section 16.3, Registration of Load Serving Entities.

(5) A "BLT Point" is the metering point for a BLT Resource ID or for a BLT ESI ID.

(6) ERCOT shall post the registration details of all registered BLTs to the MIS Secure Area.

6.5.9.5.2 Scheduling and Operation of BLTs

(1) For BLTs that are deployed in an emergency and are not modeled in the Network Operations Model, the responsible TSP shall notify ERCOT as soon as practicable after deployment.

(2) For BLTs that transfer Load to a non-ERCOT Control Area, ERCOT shall confirm the BLT's availability with the non-ERCOT Control Area before implementation.

(3) Any energy associated with the non-ERCOT Control Area Load BLT Point is treated as a Load obligation of the QSE representing the LSE with the BLT ESI ID as registered for Settlement purposes in accordance with Section 6.5.9.5.1, Registration and Posting of BLT Points.

6.5.9.6 Black Start

(1) Black Start Service (BSS) is obtained by ERCOT through Black Start Agreements with QSEs for Generation Resources capable of self-starting or Generation Resources within close proximity of a non-ERCOT Control Area that are capable of starting from that non-ERCOT Control Area under a firm standby power supply contract, without support from the ERCOT System, or transmission equipment in the ERCOT System. Generation Resources that can be started with a minimum of pre-coordinated switching operations using ERCOT transmission equipment within the ERCOT System may be considered for BSS only where switching may be accomplished within one hour or less.

(2) ERCOT may Dispatch BSS pursuant to an emergency restoration plan to begin restoration of the ERCOT System to a secure operating state after a Blackout. General restoration actions for all Market Participants are described in the Operating Guides.

6.6 Settlement Calculations for the Real-Time Energy Operations

6.6.1 Real-Time Settlement Point Prices

(1) Real-Time energy Settlements use Real-Time Settlement Point Prices that are calculated for Resource Nodes, Load Zones, and Hubs. For each Security-Constrained Economic Dispatch (SCED) Locational Marginal Price (LMP) calculated at each Settlement Point in the SCED process, an administrative price floor of -$251/MWh will be applied to Real-Time Settlement Point Prices after adding the sum of the Real-Time On-Line

Reliability Deployment Price Adders and the Real-Time On-Line Reserve Price Adder. ERCOT shall assign an LMP to de-energized Electrical Buses for use in the calculation of the Real-Time Settlement Point Prices by using heuristic rules applied in the following order:

[NPRR1010: Replace paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(1) Real-Time energy Settlements use Real-Time Settlement Point Prices that are calculated for Resource Nodes, Load Zones, and Hubs. For each Security-Constrained Economic Dispatch (SCED) Locational Marginal Price (LMP) calculated at each Settlement Point in the SCED process, an administrative price floor of -$251/MWh will be applied to Real-Time Settlement Point Prices after adding the Real-Time Reliability Deployment Price Adders for Energy. ERCOT shall assign an LMP to de-energized Electrical Buses for use in the calculation of the Real-Time Settlement Point Prices by using heuristic rules applied in the following order:

(a) Use an appropriate LMP predetermined by ERCOT as applicable to a specific Electrical Bus; or if not so specified

(b) Use the following rules in order:

(i) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.

(ii) Use average LMP for all Electrical Buses within the same station, if any exist.

(iii) Use System Lambda.

6.6.1.1 Real-Time Settlement Point Price for a Resource Node

(1) The Real-Time Settlement Point Price for a Resource Node Settlement Point is the time-weighted average of the sum of the Real-Time LMPs, Real-Time On-Line Reliability Deployment Price Adders, and the Real-Time On-Line Reserve Price Adders. The Real-Time Settlement Point Price for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTSPP} = \mathbf{Max}\left(-\$251, \left(\sum_{y} \left(\mathbf{RNWF}_{y} * \left(\mathbf{RTLMP}_{y} + \mathbf{RTORPA}_{y} + \mathbf{RTORDPA}_{y}\right)\right)\right)\right)$$

Where the Resource Node weighting factor is:

$$\mathbf{RNWF}_{y} = \mathbf{TLMP}_{y} / \sum_{y} \mathbf{TLMP}_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTSPP	$/MWh	*Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Settlement Point for the 15-minute Settlement Interval.
$RTORPA_y$	$/MWh	*Real-Time On-Line Reserve Price Adder per interval*—The Real-Time On-Line Reserve Price Adder for the SCED interval *y*.
$RTLMP_y$	$/MWh	*Real-Time Locational Marginal Price per interval*—The Real-Time LMP at the Settlement Point for the SCED interval *y*.
$RTORDPA_y$	$/MWh	*Real-Time On-Line Reliability Deployment Price Adder*—The Real-Time Price Adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.

[NPRR1010: Replace paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(1) The Real-Time Settlement Point Price for a Resource Node Settlement Point is the time-weighted average of the sum of the Real-Time LMPs and the Real-Time Reliability Deployment Price Adder for Energy. The Real-Time Settlement Point Price for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTSPP} = \mathbf{Max}\left(-\$251, \left(\sum_{y} (\mathbf{RNWF}_y * (\mathbf{RTLMP}_y + \mathbf{RTRDPA}_y))\right)\right)$$

Where the Resource Node weighting factor is:

$$\mathbf{RNWF}_y = \mathbf{TLMP}_y / \sum_{y} \mathbf{TLMP}_y$$

The above variables are defined as follows:

Variable	Unit	Description
RTSPP	$/MWh	*Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Settlement Point for the 15-minute Settlement Interval.
$RTLMP_y$	$/MWh	*Real-Time Locational Marginal Price per interval*—The Real-Time LMP at the Settlement Point for the SCED interval *y*.
$RTRDPA_y$	$/MWh	*Real-Time Reliability Deployment Price Adder for Energy*—The Real-Time price adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.

$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.

(2) The Real-Time Settlement Point Price at the logical Resource Node for a Combined Cycle Train shall be determined in accordance with paragraph (1) above using a Real-Time LMP calculated for the logical Resource Node in each SCED Interval as follows:

(a) The Real-Time LMP for the logical Resource Node of a Combined Cycle Train for each SCED interval is calculated as follows:

For a Combined Cycle Train that is On-Line in the SCED interval:

$$\mathbf{RTLMP}_y = \sum_{CCGR\_PhyR} \mathbf{RTLMP}_{CCGR\_PhyR, y} * \mathbf{RTONCCGRWF}_{CCGR\_PhyR}$$

For a Combined Cycle Train that is Off-Line in the SCED interval:

$$\mathbf{RTLMP}_y = \sum_{CCT\_PhyR} \mathbf{RTLMP}_{CCT\_PhyR, y} * \mathbf{RTOFFCCGRWF}_{CCT\_PhyR}$$

The above variables are defined as follows:

Variable	Unit	Definition
$RTLMP_y$	$/MWh	*Real-Time Locational Marginal Price at a logical Resource Node for a Combined Cycle Train*—The Real-Time LMP at the Combined Cycle Generation Resource logical Resource Node for a SCED interval *y*.
$RTLMP_{CCGR\_PhyR, y}$	$/MWh	*Real-Time Locational Marginal Price at a generation unit Resource Node designated in a Combined Cycle Train registration for the On-Line Combined Cycle Generation Resource*—The Real-Time LMP at the Resource Node of a generation unit designated in a Combined Cycle Train registration for the On-Line Combined Cycle Generation Resource for the SCED interval *y*.
$RTLMP_{CCT\_PhyR, y}$	$/MWh	*Real-Time Locational Marginal Price at a generation unit Resource Node registered to the Combined Cycle Train*—The Real-Time LMP at the Resource Node of a generation unit designated in a Combined Cycle Train registration for the SCED interval *y*.
$RTONCCGRWF_{CCGR\_PhyR, y}$	none	*Real-Time On-Line Combined Cycle Generation Resource Weighting Factor*—The Real Time Combined Cycle Generation Resource weighting factor for a generation unit designated in a Combined Cycle Train registration for the On-Line Combined Cycle Generation Resource for the SCED interval *y*.
$RTOFFCCGRWF_{CCT\_PhyR, y}$	none	*Real-Time Off-Line Combined Cycle Generation Resource Weighting Factor*—The Real-Time Combined Cycle Generation Resource weighting factor for a generation unit designated in a Combined Cycle Train registration when the whole Combined Cycle Train is Off-Line for the SCED interval *y*.
CCGR_PhyR	none	A generation unit designated in a Combine Cycle Train registration for the On-Line Combined Cycle Generation Resource.
CCT_PhyR	none	A generation unit designated in a Combine Cycle Train registration
c	none	A binding transmission constraint for the SCED interval *y*.

y	none	A SCED interval in the 15-minute Settlement Interval.

(b) For an On-Line Combined Cycle Train, the weight factor for each generation unit registered in an On-Line Combined Cycle Generation Resource shall be the Real-Time power output telemetry in each SCED interval for each generation unit registered in the Combined Cycle Generation Resource divided by the total Real-Time power output telemetry for all of the generation units registered in the Combined Cycle Generation Resource. For an Off-Line Combined Cycle Train, the weight factor for each generation unit designated in a Combined Cycle Train registration shall be its High Reasonability Limit (HRL) divided by the total sum of the HRL for all generation units registered in the Combined Cycle Train.

Where:

$$\mathbf{RTONCCGRWF}_{CCGR\_PhyR,\,y} = \mathbf{TG}_{CCGR\_PhyR} / \sum_{CCGR\_PhyR} \mathbf{TG}_{CCGR\_PhyR}$$

$$\mathbf{RTOFFCCGRWF}_{CCT\_PhyR,\,y} = \mathbf{HRL}_{CCT\_PhyR} / \sum_{CCT\_PhyR} \mathbf{HRL}_{CCT\_PhyR}$$

The above variables are defined as follows:

Variable	Unit	Definition
RTONCCGRWF $_{CCGR\_PhyR,\,y}$	none	*Real-Time On-Line Combined Cycle Generation Resource Weighting Factor*—The Real Time Combined Cycle Generation Resource weighting factor for a generation unit designated in a Combined Cycle Train registration for the On-Line Combined Cycle Generation Resource for the SCED interval *y*.
TG $_{CCGR\_PhyR,\,y}$	MW	*Telemetered Generation for a Combined Cycle Generation Resource generation unit*—The telemetered Real-Time power generation for a generation unit designated in a Combined Cycle Train registration for the On-Line Combined Cycle Generation Resource at the time of State Estimator execution for the SCED interval *y*.
RTOFFCCGRWF $_{CCT\_PhyR,\,y}$	none	*Real-Time Off-Line Combined Cycle Generation Resource Weighting Factor*—The Real Time Combined Cycle Generation Resource weighting factor for a generation unit designated in a Combined Cycle Train registration when the whole Combined Cycle Train is Off-Line for the SCED interval *y*.
HRL $_{CCT\_PhyR}$	MW	*High Reasonability Limit*—The HRL as specified in the ERCOT-approved Resource Registration data for a generation unit designated in a Combined Cycle Train registration.
CCGR_PhyR	none	A generation unit designated in a Combine Cycle Train registration for the On-Line Combined Cycle Generation Resource.
CCT_PhyR	none	A generation unit designated in a Combine Cycle Train registration.
y	none	A SCED interval in the 15-minute Settlement Interval.

6.6.1.2 Real-Time Settlement Point Price for a Load Zone

(1) The Real-Time Settlement Point Price for a Load Zone Settlement Point is based on the state-estimated Load in MW and the time-weighted average Real-Time LMPs at Electrical Buses that are included in the Load Zone. The Real-Time Settlement Point

Price for a Load Zone Settlement Point for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTSPP} = \mathbf{Max\ (-\$251,\ ((\sum_{y}\ TLMP_{y} * LZLMP_{y}) / \sum_{y}\ TLMP_{y}) + RTRSVPOR + RTRDP)}$$

For all Load Zones except Direct Current Tie (DC Tie) Load Zones:

$$LZLMP_{y} = \sum_{b}\ (RTLMP_{b,y} * SEL_{b,y}) / \sum_{b}\ SEL_{b,y}$$

For a DC Tie Load Zone:

$$LZLMP_{y} = RTLMP_{b,y}$$

Where:

$$RTRSVPOR = \sum_{y}\ (RNWF_{y} * RTORPA_{y})$$

$$RTRDP = \sum_{y}\ (RNWF_{y} * RTORDPA_{y})$$

$$RNWF_{y} = TLMP_{y} / \sum_{y}\ TLMP_{y}$$

[NPRR1010: Replace paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(1) The Real-Time Settlement Point Price for a Load Zone Settlement Point is based on the state-estimated Load in MW and the time-weighted average Real-Time LMPs at Electrical Buses that are included in the Load Zone. The Real-Time Settlement Point Price for a Load Zone Settlement Point for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTSPP} = \mathbf{Max\ (-\$251,\ ((\sum_{y}\ TLMP_{y} * LZLMP_{y}) / \sum_{y}\ TLMP_{y}) + RTRDP)}$$

For all Load Zones except Direct Current Tie (DC Tie) Load Zones:

$$LZLMP_{y} = \sum_{b}\ (RTLMP_{b,y} * SEL_{b,y}) / \sum_{b}\ SEL_{b,y}$$

For a DC Tie Load Zone:

$$LZLMP_{y} = RTLMP_{b,y}$$

Where:

$$RTRDP = \sum_{y} (RNWF_{y} * RTRDPA_{y})$$

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

(2) For all Settlement calculations in which a 15-minute Real-Time Settlement Point Price for a Load Zone is required in order to perform Settlement for a 15-minute quantity that is represented as one value (the integrated value for the 15-minute interval) but varies with each SCED interval within the 15-minute Settlement Interval, an energy-weighted Real-Time Settlement Point Price shall be used and is calculated as follows:

$$\mathbf{RTSPPEW = Max\ [-\$251, (\sum_{y} \sum_{b} (RTLMP_{b,y} * LZWF_{b,y}) + RTRSVPOR + RTRDP)]}$$

For all Load Zones except DC Tie Load Zones:

$$LZWF_{b,y} = (SEL_{b,y} * TLMP_{y}) / [\sum_{y} \sum_{b} (SEL_{b,y} * TLMP_{y})]$$

For a DC Tie Load Zone:

$$LZWF_{b,y} = (SEL_{b,y} * TLMP_{y}) / [\sum_{y} \sum_{b} (SEL_{b,y} * TLMP_{y})]$$

$$SEL_{b,y} = 1$$

Where:

$$RTRSVPOR = \sum_{y} (RNWF_{y} * RTORPA_{y})$$

$$RTRDP = \sum_{y} (RNWF_{y} * RTORDPA_{y})$$

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTSPP	$/MWh	*Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Settlement Point, for the 15-minute Settlement Interval.
RTSPPEW	$/MWh	*Real-Time Settlement Point Price Energy-Weighted*—The Real-Time Settlement Point Price at the Settlement Point *p*, for the 15-minute Settlement Interval that is weighted by the state-estimated Load of the Load Zone of each SCED interval within the 15-minute Settlement Interval.

$RTLMP_{b,y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP at Electrical Bus *b* in the Load Zone, for the SCED interval *y*.
RTRSVPOR	$/MWh	*Real-Time Reserve Price for On-Line Reserves*—The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval.
$RTORPA_y$	$/MWh	*Real-Time On-Line Reserve Price Adder per interval*—The Real-Time Price Adder for On-Line Reserves for the SCED interval *y*.
RTRDP	$/MWh	*Real-Time On-Line Reliability Deployment Price*—The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder.
$RTORDPA_y$	$/MWh	*Real-Time On-Line Reliability Deployment Price Adder*—The Real-Time Price Adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$LZWF_{b,y}$	none	*Load Zone Weighting Factor per bus per interval*—The weight used in the Load Zone Settlement Point Price calculation for Electrical Bus *b*, for the portion of the SCED interval *y* within the 15-minute Settlement Interval.
$LZLMP_y$	$/MWh	*Load Zone Locational Marginal Price*—The Load Zone LMP for the Load Zone for the SCED interval *y*.
$SEL_{b,y}$	MW	*State Estimator Load at bus per interval*—The Load value from State Estimator, including a calculated net Load value at each Private Use Network and adjustments to account for Distribution Generation Resource (DGR) and Distribution Energy Storage Resource (DESR) injections and withdrawals that are settled at a Resource Node, excluding Wholesale Storage Load (WSL) and Non-WSL Energy Storage Resource (ESR) Charging Load for Electrical Bus *b* in the Load Zone, for the SCED interval *y*.
$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An Electrical Bus in the Load Zone. The summation is over all of the Electrical Buses in the Load Zone.

[NPRR1010: Replace paragraph (2) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(2) For all Settlement calculations in which a 15-minute Real-Time Settlement Point Price for a Load Zone is required in order to perform Settlement for a 15-minute quantity that is represented as one value (the integrated value for the 15-minute interval) but varies with each SCED interval within the 15-minute Settlement Interval, an energy-weighted Real-Time Settlement Point Price shall be used and is calculated as follows:

$$\mathbf{RTSPPEW} = \mathbf{Max}\left[-\$251, \left(\sum_{y}\sum_{b}\left(RTLMP_{b,y} * LZWF_{b,y}\right) + RTRDP\right)\right]$$

For all Load Zones except DC Tie Load Zones:

$$LZWF_{b,y} = (SEL_{b,y} * TLMP_{y}) / [\sum_{y} \sum_{b} (SEL_{b,y} * TLMP_{y})]$$

For a DC Tie Load Zone:

$$LZWF_{b,y} = (SEL_{b,y} * TLMP_{y}) / [\sum_{y} \sum_{b} (SEL_{b,y} * TLMP_{y})]$$

$$SEL_{b,y} = 1$$

Where:

$$RTRDP = \sum_{y} (RNWF_{y} * RTRDPA_{y})$$

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTSPP	$/MWh	*Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Settlement Point, for the 15-minute Settlement Interval.
RTSPPEW	$/MWh	*Real-Time Settlement Point Price Energy-Weighted*—The Real-Time Settlement Point Price at the Settlement Point *p*, for the 15-minute Settlement Interval that is weighted by the state-estimated Load of the Load Zone of each SCED interval within the 15-minute Settlement Interval.
$RTLMP_{b,y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP at Electrical Bus *b* in the Load Zone, for the SCED interval *y*.
RTRDP	$/MWh	*Real-Time Reliability Deployment Price for Energy*—The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time Reliability Deployment Price Adder for Energy.
$RTRDPA_{y}$	$/MWh	*Real-Time Reliability Deployment Price Adder for Energy*—The Real-Time price adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$RNWF_{y}$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$LZWF_{b,y}$	none	*Load Zone Weighting Factor per bus per interval*—The weight used in the Load Zone Settlement Point Price calculation for Electrical Bus *b*, for the portion of the SCED interval *y* within the 15-minute Settlement Interval.
$LZLMP_{y}$	$/MWh	*Load Zone Locational Marginal Price*—The Load Zone LMP for the Load Zone for the SCED interval *y*.
$SEL_{b,y}$	MW	*State Estimator Load at bus per interval*—The Load value from State Estimator, including a calculated net Load value at each Private Use Network and adjustments to account for Distribution Generation Resource (DGR) and Distribution Energy Storage Resource (DESR) injections and withdrawals that are settled at a Resource

		Node, excluding Wholesale Storage Load (WSL) and Non-WSL Energy Storage Resource (ESR) Charging Load, for Electrical Bus *b* in the Load Zone, for the SCED interval *y*.
$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An Electrical Bus in the Load Zone. The summation is over all of the Electrical Buses in the Load Zone.

6.6.1.3 Real-Time Settlement Point Price for a Hub

(1) The Real-Time Settlement Point Price at a Hub is determined according to the methodology included in the definition of that Hub in Section 3.5.2, Hub Definitions.

6.6.1.4 Load Zone LMPs

(1) The Load Zone LMPs shall be posted on the ERCOT website. The Load Zone LMP is based on the state-estimated Loads in MW and the Real-Time LMPs at the Electrical Buses included in the Load Zone. The Load Zone LMP for a Load Zone for a SCED interval is calculated as follows:

$$\mathbf{LZLMP}_y = \sum_b (\mathbf{RTLMP}_{b,y} * \mathbf{LZWF}_{b,y})$$

For all Load Zones except DC Tie Load Zones:

$$\mathbf{LZWF}_{b,y} = \mathbf{SEL}_{b,y} / (\sum_b \mathbf{SEL}_{b,y})$$

For a DC Tie Load Zone:

$$\mathbf{LZWF}_{b,y} = [\mathbf{Max}\ (0.001, \mathbf{SEL}_{b,y})] \ / \ [\mathbf{Max}\ (0.001, \mathbf{SEL}_{b,y})]$$

The above variables are defined as follows:

Variable	Unit	Description
$LZLMP_y$	$/MWh	*Load Zone Locational Marginal Price*—The Load Zone LMP for the Load Zone for the SCED interval *y*.
$RTLMP_{b,y}$	$/MWh	*Real-Time Locational Marginal Price at bus per SCED interval*—The Real-Time LMP at Electrical Bus *b* in the Load Zone, for the SCED interval *y*.
$LZWF_{b,y}$	None	*Load Zone State Estimator Load Weighting Factor per bus per SCED interval*—The weight used in the Load Zone LMP calculation for Electrical Bus *b* for the SCED interval *y*.
$SEL_{b,y}$	MW	*State Estimator Load at bus per SCED interval*—The Load from the State Estimator, including a calculated net Load value at each Private Use Network and adjustments to account for DGR and DESR injections and withdrawals that are settled at a Resource

		Node, excluding WSL and Non-WSL ESR Charging Load for Electrical Bus *b* in the Load Zone, for the SCED interval *y*.
y	None	A SCED interval.
b	None	An Electrical Bus in the Load Zone. The summation is over all of the Electrical Buses in the Load Zone.

6.6.1.5 Hub LMPs

(1) The Hub LMPs shall be posted on the ERCOT website.

(2) For each defined Hub except for the ERCOT Hub Average 345 kV Hub, the Hub LMP is the arithmetic average of the Real-Time LMPs of the Hub Buses included in the Hub. The Hub LMP for a SCED Interval is calculated as follows:

$$\mathbf{HUBLMP}_{Hub,\,y} = \sum_{hb} (\mathbf{HUBDF}_{hb,\,Hub} * \mathbf{RTHBP}_{hb,\,Hub,\,y}), \textbf{ if } \mathbf{HB}_{Hub} \neq \mathbf{0}$$

$$\mathbf{HUBLMP}_{Hub,\,y} = \mathbf{HUBLMP}_{ERCOT345Bus}, \textbf{ if } \mathbf{HB}_{Hub} = \mathbf{0}$$

Where:

$$\text{RTHBP}_{hb,\,Hub,\,y} = \sum_{b} (\text{HBDF}_{b,\,hb,\,Hub} * \text{RTLMP}_{b,\,hb,\,Hub,\,y})$$

$$\text{HUBDF}_{hb,\,Hub} = 1 / \text{HB}_{Hub}, \text{ if HB}_{Hub} \neq 0$$

$$\text{HUBDF}_{hb,\,Hub} = 0, \text{ if HB}_{Hub} = 0$$

$$\text{HBDF}_{b,\,hb,\,Hub} = 1 / \text{B}_{hb,\,Hub}, \text{ if B}_{hb,\,Hub} \neq 0$$

$$\text{HBDF}_{b,\,hb,\,Hub} = 0, \text{ if B}_{hb,\,Hub} = 0$$

The above variables are defined as follows:

Variable	Unit	Description
$\text{HUBLMP}_{Hub,\,y}$	$/MWh	*Hub Locational Marginal Price*—The Hub LMP for the Hub for the SCED Interval *y*.
$\text{RTHBP}_{hb,\,Hub,\,y}$	$/MWh	*Real-Time Hub Bus Price at Hub Bus per SCED interval*—The Real-Time energy price at Hub Bus *hb* for the SCED interval *y*.
$\text{RTLMP}_{b,\,hb,\,Hub,\,y}$	$/MWh	*Real-Time Locational Marginal Price at Electrical Bus of Hub Bus per interval*—The Real-Time LMP at Electrical Bus *b* that is a component of Hub Bus *hb*, for the SCED interval *y*.
$\text{HUBDF}_{hb,\,Hub}$	none	*Hub Distribution Factor per Hub Bus*—The distribution factor of Hub Bus *hb*.
$\text{HBDF}_{b,\,hb,\,Hub}$	none	*Hub Bus Distribution Factor per Electrical Bus of Hub Bus*—The distribution factor of Electrical Bus *b* that is a component of Hub Bus *hb*.
$\text{B}_{hb,\,Hub}$	none	The total number of energized Electrical Buses in Hub Bus *hb*.

HB_{Hub}	none	The total number of Hub Buses in the Hub with at least one energized component in each Hub Bus.
Hub	none	One of the following Hubs: ERCOT Bus Average 345 kV Hub, North 345 kV Hub, South 345 kV Hub, Houston 345 kV Hub, or the West 345 kV Hub
hb	none	A Hub Bus that is a component of the Hub.
y	none	A SCED interval.
b	none	An energized Electrical Bus that is a component of a Hub Bus.

(3) The Hub LMP for the ERCOT Hub Average 345 kV Hub (ERCOT 345) for a SCED Interval is calculated as follows:

$$\mathbf{HUBLMP}_{ERCOT345,\,y} = \mathbf{(HUBLMP}_{NORTH345,\,y} + \mathbf{HUBLMP}_{SOUTH345,\,y} + \mathbf{HUBLMP}_{HOUSTON345,\,y} + \mathbf{HUBLMP}_{WEST345,\,y}\mathbf{) / 4}$$

The above variables are defined as follows:

Variable	Unit	Description
$HUBLMP_{ERCOT345,\,y}$	$/MWh	*Hub Locational Marginal Price for the ERCOT345*—The Hub LMP for the ERCOT Hub Average 345 kV Hub (ERCOT 345), for the SCED Interval *y*.
$HUBLMP_{NORTH345,\,y}$	$/MWh	*Hub Locational Marginal Price for the NORTH345*—The Hub LMP for the North 345 kV Hub (NORTH 345), for the SCED Interval *y*.
$HUBLMP_{SOUTH345,\,y}$	$/MWh	*Hub Locational Marginal Price for the SOUTH345*—The Hub LMP for the South 345 kV Hub (SOUTH 345), for the SCED Interval *y*.
$HUBLMP_{HOUSTON345,\,y}$	$/MWh	*Hub Locational Marginal Price for the HOUSTON345*—The Hub LMP for the Houston 345 kV Hub (HOUSTON 345), for the SCED Interval *y*.
$HUBLMP_{WEST345,\,y}$	$/MWh	*Hub Locational Marginal Price for the WEST345*—The Hub LMP for the West 345 kV Hub (WEST 345), for the SCED Interval *y*.

[NPRR1057: Replace applicable portions of Section 6.6.1.5 above with the following upon system implementation of NPRR941 or NPRR1057:]

6.6.1.5 Hub LMPs

(1) The Hub LMPs shall be posted on the ERCOT website.

(2) For each defined Hub except for the ERCOT Hub Average 345 kV Hub and the ERCOT Bus Average 345 kV Hub, the Hub LMP is the arithmetic average of the Real-Time LMPs of the Hub Buses included in the Hub. The Hub LMP for a SCED Interval is calculated as follows:

$$\mathbf{HUBLMP}_{Hub,\,y} = \sum_{hb} (\mathbf{HUBDF}_{hb,\,Hub} * \mathbf{RTHBP}_{hb,\,Hub,\,y}), \textbf{ if } \mathbf{HB}_{Hub} \neq 0$$

$$\mathbf{HUBLMP}_{Hub,\,y} = \mathbf{HUBLMP}_{ERCOT345Bus,y}, \textbf{ if } \mathbf{HB}_{Hub} = 0$$

Where:

$$RTHBP_{hb,\,Hub,\,y} = \sum_{b} (HBDF_{b,\,hb,\,Hub} * RTLMP_{b,\,hb,\,Hub,\,y})$$

$$HUBDF_{hb,\,Hub} = 1 / HB_{Hub}, \text{ if } HB_{Hub} \neq 0$$

$$HUBDF_{hb,\,Hub} = 0, \text{ if } HB_{Hub} = 0$$

$$HBDF_{b,\,hb,\,Hub} = 1 / B_{hb,\,Hub}, \text{ if } B_{hb,\,Hub} \neq 0$$

$$HBDF_{b,\,hb,\,Hub} = 0, \text{ if } B_{hb,\,Hub} = 0$$

The above variables are defined as follows:

Variable	Unit	Description
$HUBLMP_{Hub,\,y}$	$/MWh	*Hub Locational Marginal Price*—The Hub LMP for the Hub for the SCED Interval *y*.
$RTHBP_{hb,\,Hub,\,y}$	$/MWh	*Real-Time Hub Bus Price at Hub Bus per SCED interval*—The Real-Time energy price at Hub Bus *hb* for the SCED interval *y*.
$HUBLMP_{ERCOT345Bus,y}$	$/MWh	*Hub Locational Marginal Price for the ERCOT345Bus*—The Hub LMP for the ERCOT Bus Average 345 kV Hub (ERCOT 345 Bus), for the SCED Interval *y*.
$RTLMP_{b,\,hb,\,Hub,\,y}$	$/MWh	*Real-Time Locational Marginal Price at Electrical Bus of Hub Bus per interval*—The Real-Time LMP at Electrical Bus *b* that is a component of Hub Bus *hb*, for the SCED interval *y*.
$HUBDF_{hb,\,Hub}$	none	*Hub Distribution Factor per Hub Bus*—The distribution factor of Hub Bus *hb*.
$HBDF_{b,\,hb,\,Hub}$	none	*Hub Bus Distribution Factor per Electrical Bus of Hub Bus*—The distribution factor of Electrical Bus *b* that is a component of Hub Bus *hb*.
$B_{hb,\,Hub}$	none	The total number of energized Electrical Buses in Hub Bus *hb*.

HB_{Hub}	none	The total number of Hub Buses in the Hub with at least one energized component in each Hub Bus.
Hub	none	One of the following Hubs: North 345 kV Hub, South 345 kV Hub, Houston 345 kV Hub, West 345 kV Hub, the Panhandle 345 kV Hub, or the Lower Rio Grande Valley 138/345 kV Hub.
hb	none	A Hub Bus that is a component of the Hub with at least one energized component.
y	none	A SCED interval.
b	none	An energized Electrical Bus that is a component of a Hub Bus.

(3) The Hub LMP for the ERCOT Hub Average 345 kV Hub (ERCOT 345) for a SCED Interval is calculated as follows:

$$\mathbf{HUBLMP}_{ERCOT345,\,y} = \mathbf{(HUBLMP}_{NORTH345,\,y} + \mathbf{HUBLMP}_{SOUTH345,\,y} + \mathbf{HUBLMP}_{HOUSTON345,\,y} + \mathbf{HUBLMP}_{WEST345,\,y}\mathbf{) / 4}$$

The above variables are defined as follows:

Variable	Unit	Description
$HUBLMP_{ERCOT345,\,y}$	$/MWh	*Hub Locational Marginal Price for the ERCOT345*—The Hub LMP for the ERCOT Hub Average 345 kV Hub (ERCOT 345), for the SCED Interval *y*.
$HUBLMP_{NORTH345,\,y}$	$/MWh	*Hub Locational Marginal Price for the NORTH345*—The Hub LMP for the North 345 kV Hub (NORTH 345), for the SCED Interval *y*.
$HUBLMP_{SOUTH345,\,y}$	$/MWh	*Hub Locational Marginal Price for the SOUTH345*—The Hub LMP for the South 345 kV Hub (SOUTH 345), for the SCED Interval *y*.
$HUBLMP_{HOUSTON345,\,y}$	$/MWh	*Hub Locational Marginal Price for the HOUSTON345*—The Hub LMP for the Houston 345 kV Hub (HOUSTON 345), for the SCED Interval *y*.
$HUBLMP_{WEST345,\,y}$	$/MWh	*Hub Locational Marginal Price for the WEST345*—The Hub LMP for the West 345 kV Hub (WEST 345), for the SCED Interval *y*.

(4) The Hub LMP for the ERCOT Bus Average 345 kV Hub (ERCOT 345 Bus) for a SCED Interval is calculated as follows:

$$\mathbf{HUBLMP}_{ERCOT345Bus,\,y} = \sum_{hb} \mathbf{(HUBDF}_{hb,ERCOT345Bus} * \mathbf{RTHBP}_{hb,\,ERCOT345Bus,\,y}\mathbf{),\ if\ HB}_{ERCOT345Bus} \neq \mathbf{0}$$

$$\mathbf{HUBLMP}_{ERCOT345Bus,\,y} = \mathbf{0,\ if\ HB}_{ERCOT345Bus} = \mathbf{0}$$

Where:

$$RTHBP_{hb,\,ERCOT345Bus,\,y} = \sum_{b} (HBDF_{b,\,hb,\,ERCOT345Bus} * RTLMP_{b,\,hb,\,ERCOT345Bus,\,y})$$

$$HUBDF_{hb,\,ERCOT345Busc} = IF(HB_{ERCOT345Bus}=0,\ 0,\ 1 / HB_{ERCOT345Bus})$$

$$HBDF_{b, hb, ERCOT345Bus} = IF(B_{hb, ERCOT345Bus}=0, 0, 1 / B_{hb, ERCOT345Bus})$$

Variable	Unit	Description
$HUBLMP_{ERCOT345Bus, y}$	$/MWh	*Hub Locational Marginal Price for the ERCOT345Bus*—The Hub LMP for the ERCOT Bus Average 345 kV Hub (ERCOT 345 Bus), for the SCED Interval *y*.
$RTHBP_{hb, ERCOT345Bus, y}$	$/MWh	*Real-Time Hub Bus Price at Hub Bus per SCED interval*—The Real-Time energy price at Hub Bus *hb* in ERCOT 345 Bus, for the SCED interval *y*.
$RTLMP_{b, hb, ERCOT345Bus, y}$	$/MWh	*Real-Time Locational Marginal Price at Electrical Bus of Hub Bus per interval*—The Real-Time LMP at Electrical Bus *b* that is a component of Hub Bus *hb* in ERCOT 345 Bus, for the SCED interval *y*.
$HUBDF_{hb, ERCOT345Bus}$	none	*Hub Distribution Factor per Hub Bus*—The distribution factor of Hub Bus *hb*.
$HBDF_{b, hb, ERCOT345Bus}$	none	*Hub Bus Distribution Factor per Electrical Bus of Hub Bus*—The distribution factor of Electrical Bus *b* that is a component of Hub Bus *hb*.
$HB_{ERCOT345Bus}$	none	The total number of Hub Buses in the ERCOT Bus Average 345 kV Hub (ERCOT 345 Bus) with at least one energized component in each Hub Bus . The Hub "ERCOT 345 Bus" includes any Hub Bus defined in the Hub "North 345", "South 345", "Houston 345" and "West 345".
$B_{hb, ERCOT345Bus}$	none	The total number of energized Electrical Buses in Hub Bus *hb* that is a component of "ERCOT 345 Bus".
hb	none	A Hub Bus that is a component of the ERCOT Bus Average 345 kV Hub (ERCOT 345 Bus) with at least one energized component. The Hub "ERCOT 345 Bus" includes any Hub Bus defined in the Hub "North 345", "South 345", "Houston 345" and "West 345".
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An energized Electrical Bus that is a component of a Hub Bus.

[NPRR1010: Insert Section 6.6.1.6 below upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.6.1.6 Real-Time Market Clearing Prices for Ancillary Services

(1) The Real-Time Market Clearing Price for Capacity (MCPC) for Reg-Up is the time-weighted average of the sum of the Real-Time MCPCs for Reg-Up and Real-Time Reliability Deployment Price Adder for Ancillary Service for Reg-Up of each SCED interval in the 15-minute Settlement Interval. The Real-Time MCPC for Reg-Up for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTMCPCRU} = \sum_{y} \mathbf{(RNWF}_{y} \mathbf{* (RTMCPCRUS}_{y} \mathbf{+ RTRDPARUS}_{y}\mathbf{))}$$

Where:

$$RNWF_y = TLMP_y / \sum_y TLMP_y$$

The above variables are defined as follows:

Variable	Unit	Description
RTMCPCRU	$/MW	*Real-Time Market Clearing Price for Capacity for Reg-Up* - The Real-Time MCPC for Reg-Up for the 15-minute Settlement Interval.
$RTMCPCRUS_y$	$/MW	*Real-Time Market Clearing Price for Capacity for Reg-Up per SCED interval* - The Real-Time MCPC for Reg-Up for the SCED interval *y*.
$RTRDPARUS_y$	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Reg-Up per SCED interval* - The Real-Time price adder for Reg-Up that captures the impact of reliability deployments on Reg-Up prices for the SCED interval y.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(2) The Real-Time MCPC for Reg-Down is the time-weighted average of the sum of the Real-Time MCPCs for Reg-Down and Real-Time Reliability Deployment Price Adder for Ancillary Service for Reg-Down of each SCED interval in the 15-minute Settlement Interval. The Real-Time MCPC for Reg-Down for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTMCPCRD} = \sum_y \mathbf{(RNWF_y * (RTMCPCRDS_y + RTRDPARDS_y))}$$

Where:

$$RNWF_y = TLMP_y / \sum_y TLMP_y$$

The above variables are defined as follows:

Variable	Unit	Description
RTMCPCRD	$/MW	*Real-Time Market Clearing Price for Capacity for Reg-Down* - The Real-Time MCPC for Reg-Down for the 15-minute Settlement Interval.
$RTMCPCRDS_y$	$/MW	*Real-Time Market Clearing Price for Capacity for Reg-Down per SCED interval* - The Real-Time MCPC for Reg-Down for the SCED interval *y*.

RTRDPARDS y	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Reg-Down per SCED interval* - The Real-Time price adder for Reg-Down that captures the impact of reliability deployments on Reg-Down prices for the SCED interval y.
RNWF $_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval y within the Settlement Interval.
TLMP $_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval y within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(3) The Real-Time MCPC for RRS is the time-weighted average of the sum of the Real-Time MCPCs for RRS and Real-Time Reliability Deployment Price Adder for Ancillary Service for RRS of each SCED interval in the 15-minute Settlement Interval. The Real-Time MCPC for RRS for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTMCPCRR} = \sum_{y} \mathbf{(RNWF}_{y} \mathbf{* (RTMCPCRRS}_{y} \mathbf{+ RTRDPARRS}_{y}\mathbf{))}$$

Where:

$$\text{RNWF}_{y} = \text{TLMP}_{y} / \sum_{y} \text{TLMP}_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTMCPCRR	$/MW	*Real-Time Market Clearing Price for Capacity for Responsive Reserve* - The Real-Time MCPC for RRS for the 15-minute Settlement Interval.
RTMCPCRRS $_y$	$/MW	*Real-Time Market Clearing Price for Capacity for Responsive Reserve per SCED interval* - The Real-Time MCPC for RRS for the SCED interval y.
RTRDPARRS y	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Responsive Reserve per SCED interval* - The Real-Time price adder for RRS that captures the impact of reliability deployments on RRS prices for the SCED interval y.
RNWF $_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval y within the Settlement Interval.
TLMP $_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval y within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(4) The Real-Time MCPC for ECRS is the time-weighted average of the sum of the Real-Time MCPC for ECRS and Real-Time Reliability Deployment Price Adder for Ancillary Service for ECRS of each SCED interval in the 15-minute Settlement

Interval. The Real-Time MCPC for ECRS for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTMCPCECR} = \sum_{y} \mathbf{(RNWF}_{y} \mathbf{* (RTMCPCECRS}_{y} \mathbf{+ RTRDPAECRS}_{y}\mathbf{))}$$

Where:

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTMCPCECR	$/MW	*Real-Time Market Clearing Price for Capacity for ERCOT Contingency Reserve* - The Real-Time MCPC for ECRS for the 15-minute Settlement Interval.
$RTMCPCECRS_{y}$	$/MW	*Real-Time Market Clearing Price for Capacity for ERCOT Contingency Reserve per SCED interval* - The Real-Time MCPC for ECRS for the SCED interval *y*.
RTRDPAECRS *y*	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for ECRS per SCED interval* - The Real-Time price adder for ECRS that captures the impact of reliability deployments on ECRS prices for the SCED interval y.
$RNWF_{y}$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_{y}$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(5) The Real-Time MCPC for Non-Spin is the time-weighted average of the sum of the Real-Time MCPC for Non-Spin and Real-Time Reliability Deployment Price Adders for Ancillary Service for Non-Spin of each SCED interval in the 15-minute Settlement Interval. The Real-Time MCPC for Non-Spin for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTMCPCNS} = \sum_{y} \mathbf{(RNWF}_{y} \mathbf{* (RTMCPCNSS}_{y} \mathbf{+ RTRDPANSS}_{y}\mathbf{))}$$

Where:

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTMCPCNS	$/MW	*Real-Time Market Clearing Price for Capacity for Non-Spin* - The Real-Time MCPC for Non-Spin for the 15-minute Settlement Interval.

RTMCPCNSS $_y$	$/MW	*Real-Time Market Clearing Price for Capacity for Non-Spin per SCED interval* - The Real-Time MCPC for Non-Spin for the SCED interval *y*.
RTRDPANSS *y*	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Non-Spin per SCED interval* - The Real-Time price adder for Non-Spin that captures the impact of reliability deployments on Non-Spin prices for the SCED interval y.
RNWF $_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
TLMP $_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

[NPRR1010: Insert Section 6.6.1.7 below upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.6.1.7 Real-Time Reliability Deployment Prices for Ancillary Services

(1) The Real-Time Reliability Deployment Price for Ancillary Service for Reg-Up (RTRDPRU) is the time-weighted average of the sum of the Real-Time Reliability Deployment Price Adders for Ancillary Service for Reg-Up per SCED interval. The Real-Time Reliability Deployment Price for Ancillary Service for Reg-Up for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTRDPRU} = \sum_{y} \mathbf{(RNWF}_{y} \mathbf{*\ RTRDPARUS}_{y}\mathbf{)}$$

Where:

$$\text{RNWF}_{y} = \text{TLMP}_{y} / \sum_{y} \text{TLMP}_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTRDPRU	$/MW	*Real-Time Reliability Deployment Price for Ancillary Service for Reg-Up* - The Real-Time Reliability Deployment Price for Ancillary Service for Reg-Up for the 15-minute Settlement Interval.
RTRDPARUS $_y$	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Reg-Up per SCED interval* - The Real-Time price adder for Reg-Up that captures the impact of reliability deployments on Reg-Up prices for the SCED interval y.
RNWF $_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
TLMP $_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.

y	none	A SCED interval in the 15-minute Settlement Interval.

(2) The Real-Time Reliability Deployment Price for Ancillary Service for Reg-Down (RTRDPRD) is the time-weighted average of the sum of the Real-Time Reliability Deployment Price Adders for Ancillary Service for Reg-Down per SCED interval. The Real-Time Reliability Deployment Price for Ancillary Service for Reg-Down for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTRDPRD} = \sum_{y} \mathbf{(RNWF}_{y} \mathbf{* RTRDPARDS}_{y}\mathbf{)}$$

Where:

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTRDPRD	$/MW	*Real-Time Reliability Deployment Price for Ancillary Service for Reg-Down* - The Real-Time Reliability Deployment Price for Ancillary Service for Reg-Down for the 15-minute Settlement Interval.
RTRDPARDS *y*	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Reg-Down per SCED interval* - The Real-Time price adder for Reg-Down that captures the impact of reliability deployments on Reg-Down prices for the SCED interval *y*.
$RNWF_{y}$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_{y}$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(3) The Real-Time Reliability Deployment Price for Ancillary Service for Responsive Reserve (RTRDPRRS) is the time-weighted average of the sum of the Real-Time Reliability Deployment Price Adders for Ancillary Service for Responsive Reserve per SCED interval. The Real-Time Reliability Deployment Price for Ancillary Service for Responsive Reserve for a 15-minute Settlement Interval is calculated as follows:

$$RTRDPRRS = \sum_{y} (RNWF_{y} * RTRDPARRS_{y})$$

Where:

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTRDPRRS	$/MW	*Real-Time Reliability Deployment Price for Ancillary Service for Responsive Reserve* - The Real-Time Reliability Deployment Price for Ancillary Service for RRS for the 15-minute Settlement Interval.
RTRDPARRS *y*	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Responsive Reserve per SCED interval* - The Real-Time price adder for RRS that captures the impact of reliability deployments on RRS prices for the SCED interval y.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(4) The Real-Time Reliability Deployment Price for Ancillary Service for ERCOT Contingency Reserve (RTRDPECR) is the time-weighted average of the sum of the Real-Time Reliability Deployment Price Adders for Ancillary Service for ERCOT Contingency Reserve per SCED interval. The Real-Time Reliability Deployment Price for Ancillary Service for ERCOT Contingency Reserve for a 15-minute Settlement Interval is calculated as follows:

$$RTRDPECR = \sum_{y} (RNWF_y * RTRDPAECRS_y)$$

Where:

$$RNWF_y = TLMP_y / \sum_{y} TLMP_y$$

The above variables are defined as follows:

Variable	Unit	Description
RTRDPECR	$/MW	*Real-Time Market Clearing Price for Capacity for ERCOT Contingency Reserve* - The Real-Time Reliability Deployment Price for Ancillary Service for ECRS for the 15-minute Settlement Interval.
RTRDPAECRS *y*	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for ECRS per SCED interval* - The Real-Time price adder for ECRS that captures the impact of reliability deployments on ECRS prices for the SCED interval y.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_y$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

(5) The Real-Time Reliability Deployment Price for Ancillary Service for ERCOT Non-Spin (RTRDPNS) is the time-weighted average of the sum of the Real-Time Reliability Deployment Price Adders for Ancillary Service for Non-Spin per SCED interval. The Real-Time Reliability Deployment Price for Ancillary Service for Non-Spin for a 15-minute Settlement Interval is calculated as follows:

$$RTRDPNS = \sum_{y} (RNWF_{y} * RTRDPANSS_{y})$$

Where:

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTRDPNS	$/MW	*Real-Time Market Clearing Price for Capacity for Non-Spin* - The Real-Time Reliability Deployment Price for Ancillary Service for ECRS for the 15-minute Settlement Interval.
RTRDPANSS *y*	$/MW	*Real-Time Reliability Deployment Price Adder for Ancillary Service for Non-Spin per SCED interval* - The Real-Time price adder for Non-Spin that captures the impact of reliability deployments on Non-Spin prices for the SCED interval y.
$RNWF_{y}$	none	*Resource Node Weighting Factor per interval*—The weight used in the Ancillary Service Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$TLMP_{y}$	second	*Duration of SCED interval per interval*—The duration of the portion of the SCED interval *y* within the Settlement Interval.
y	none	A SCED interval in the 15-minute Settlement Interval.

6.6.2 Load Ratio Share

6.6.2.1 ERCOT Total Adjusted Metered Load for a 15-Minute Settlement Interval

(1) ERCOT total Adjusted Metered Load (AML) for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTAMLTOT} = \sum_{q} \mathbf{(max(0, \sum_{p} RTAML_{q,p}))}$$

The above variables are defined as follows:

Variable	Unit	Description
RTAMLTOT	MWh	*Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the 15-minute Settlement Interval.
$RTAML_{q,p}$	MWh	*Real-Time Adjusted Metered Load per Qualified Scheduling Entity (QSE) per Settlement Point*—The sum of the AML at the Electrical Buses that are included in Settlement

		Point *p*, represented by Qualified Scheduling Entity (QSE) *q*, for the 15-minute Settlement Interval.
q	none	A QSE. The summation is over all of the QSEs with metered readings in that interval.
p	none	A Settlement Point. The summation is over all of the Settlement Points.

6.6.2.2 QSE Load Ratio Share for a 15-Minute Settlement Interval

(1) Each QSE's Load Ratio Share (LRS) for a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{LRS}_q = \mathbf{(max(0, \sum_p RTAML_{q,p})) / RTAMLTOT}$$

The above variables are defined as follows:

Variable	Unit	Description
LRS_q	none	*Load Ratio Share per QSE*—The LRS as defined in Section 2, Definitions and Acronyms, for QSE *q*, for the 15-minute Settlement Interval.
$RTAML_{q,p}$	MWh	*Real-Time Adjusted Metered Load per Settlement Point per QSE*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
RTAMLTOT	MWh	*Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Settlement Point. The summation is over all of the Settlement Points.

[NPRR1030: Insert paragraphs (2)-(4) below upon system implementation:]

(2) Each QSE's MLRS, excluding DC Tie exports included in RTAML, for ERCOT's peak Load 15-minute Settlement Interval in the calendar month is calculated as follows:

$$\mathbf{MLRS}_q = \mathbf{max(0, \sum_p (RTAML_{q,p} - RTAMLDC_{q,p})) / (RTAMLTOT - \sum_q \sum_p RTAMLDC_{q,p})}$$

The above variables are defined as follows:

Variable	Unit	Description
$MLRS_q$	none	*Monthly Load Ratio Share per QSE*—The ratio share of Loads excluding DC Tie Exports for QSE *q*, for the peak Load 15-minute Settlement Interval.
$RTAML_{q,p}$	MWh	*Real-Time Adjusted Metered Load per Settlement Point per QSE*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
$RTAMLDC_{q,p}$	MWh	*Real-Time Adjusted Metered Load for DC Ties per Settlement Point per QSE*—The sum of the DC Tie AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
RTAMLTOT	MWh	*Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the 15-minute Settlement Interval.

q	none	A QSE.
p	none	A Settlement Point. The summation is over all of the Settlement Points.

(3) ERCOT total AML per Congestion Management Zone (CMZ) excluding DC Tie exports included in RTAML for ERCOT's peak Load 15-minute Settlement Interval in the calendar month is calculated as follows:

$$\mathbf{RTAMLLZTOT_z} = \sum_q \mathbf{(max(0, \sum_p (RTAML_{q,p} - RTAMLDC_{q,p})))}$$

The above variables are defined as follows:

Variable	Unit	Description
$RTAMLLZTOT_z$	MWh	*Real-Time Adjusted Metered Load - Load Zone Total*—The total AML excluding DC Tie exports in CMZ z, for the peak Load 15-minute Settlement Interval in the calendar month.
$RTAML_{q,p}$	MWh	*Real-Time Adjusted Metered Load per QSE per Settlement Point*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
$RTAMLDC_{q,p}$	MWh	*Real-Time Adjusted Metered Load for DC Ties per Settlement Point per QSE*—The sum of the DC Tie AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Settlement Point in the 2003 ERCOT CMZ.
z	none	A 2003 ERCOT CMZ.

(4) Each QSE's MLRSZ, excluding DC Tie exports included in RTAML, by CMZ for ERCOT's peak Load 15-minute Settlement Interval in the calendar month is calculated as follows:

$$\mathbf{MLRSZ_{q,z}} = \mathbf{max(0, \sum_p (RTAML_{q,p} - RTAMLDC_{q,p})) / RTAMLLZTOT_z}$$

The above variables are defined as follows:

Variable	Unit	Description
$MLRSZ_{q,z}$	none	*Monthly Load Ratio Share Zonal per QSE per zone*—The ratio share of QSE *q* for its Load excluding DC Tie Exports in CMZ *z*, for the peak Load 15-minute Settlement Interval in the month.
$RTAML_{q,p}$	MWh	*Real-Time Adjusted Metered Load per Settlement Point per QSE*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
$RTAMLDC_{q,p}$	MWh	*Real-Time Adjusted Metered Load for DC Ties per Settlement Point per QSE*—The sum of the DC Tie AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
$RTAMLLZTOT_z$	MWh	*Real-Time Adjusted Metered Load - Load Zone Total*—The total AML excluding DC Tie exports in CMZ z, for the peak Load 15-minute Settlement Interval in the calendar month.
q	none	A QSE.
p	none	A Settlement Point in the 2003 ERCOT CMZ.

z	none	A 2003 ERCOT CMZ.

6.6.2.3 ERCOT Total Adjusted Metered Load for an Operating Hour

(1) ERCOT total AML for an Operating Hour is calculated as follows:

$$\mathbf{HRTAMLTOT} = \sum_{q} \left(\max\left(0, \sum_{i=1}^{4} \sum_{p} \mathbf{RTAML}_{q,p}\right)\right)$$

The above variables are defined as follows:

Variable	Unit	Description
HRTAMLTOT	MWh	*Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the Operating Hour.
$RTAML_{q,p}$	MWh	*Real-Time Adjusted Metered Load per QSE per Settlement Point*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval.
q	none	A QSE. The summation is over all of the QSEs with metered readings in that interval.
p	none	A Settlement Point. The summation is over all of the Settlement Points.
i	none	A 15-minute Settlement Interval in the Operating Hour. The summation is over all of the Settlement Intervals of the Operating Hour.

6.6.2.4 QSE Load Ratio Share for an Operating Hour

(1) Each QSE's LRS for an Operating Hour is calculated as follows:

$$\mathbf{HLRS}_{q} = \left(\max\left(0, \sum_{i=1}^{4} \sum_{p} \mathbf{RTAML}_{q,p,i}\right)\right) / \mathbf{(HRTAMLTOT)}$$

The above variables are defined as follows:

Variable	Unit	Description
$HLRS_{q}$	none	*Hourly Load Ratio Share per QSE*—The LRS as defined in Section 2, Definitions and Acronyms, for QSE *q*, for the hour.
$RTAML_{q,p,i}$	MWh	*Real-Time Adjusted Metered Load per Settlement Point per QSE by interval*—The sum of the AML at the Electrical Buses that are included in the Settlement Point *p*, represented by QSE *q* for the 15-minute Settlement Interval *i*.
HRTAMLTOT	MWh	*Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the Operating Hour.
p	none	A Settlement Point. The summation is over all of the Settlement Points.
i	none	A 15-minute Settlement Interval in the Operating Hour. The summation is over all of the Settlement Intervals of the Operating Hour.

[NPRR1030: Insert Section 6.6.2.5 below upon system implementation:]

6.6.2.5 ERCOT Total Adjusted Metered Load for a Month

(1) ERCOT total AML for a calendar month is calculated as follows:

$$\mathbf{MRTAMLTOT} = \sum_{q} \mathbf{(max(0, \sum_{i} \sum_{p} RTAML_{q,p,i}))}$$

The above variables are defined as follows:

Variable	Unit	Description
MRTAMLTOT	MWh	*Monthly Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the calendar month.
$RTAML_{q,p,i}$	MWh	*Real-Time Adjusted Metered Load per QSE per Settlement Point*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval *i*.
q	none	A QSE.
p	none	A Settlement Point.
i	none	A 15-minute Settlement Interval.

[NPRR1030 : Insert Section 6.6.2.6 below upon system implementation:]

6.6.2.6 QSE DC Tie Export Load Ratio Share for a Month

(1) Each QSE's DC Tie Export DCMLRS for a calendar month is calculated as follows:

$$\mathbf{DCMLRS}_q = \mathbf{max(0, \sum_{i} \sum_{p} RTAMLDC_{q,p,i}) / MRTAMLTOT}$$

The above variables are defined as follows:

Variable	Unit	Description
$DCMLRS_q$	none	*DC Tie Export Monthly Load Ratio Share per QSE*—The ratio share calculated for QSE *q* with DC Tie Exports for the calendar month.
$RTAMLDC_{q,p,i}$	MWh	*Real-Time Adjusted Metered Load for DC Ties per Settlement Point per QSE*—The sum of the DC Tie AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval *i*.
MRTAMLTOT	MWh	*Monthly Real-Time Adjusted Metered Load Total*—The total AML in ERCOT, for the calendar month.
q	none	A QSE.
p	none	A Settlement Point.
i	none	A 15-minute Settlement Interval.

[NPRR1030: Insert Section 6.6.2.7 below upon system implementation:]

6.6.2.7 ERCOT Adjusted Metered Load by Congestion Management Zone for a Month

(1) ERCOT total AML per CMZ for a calendar month is calculated as follows:

$$\mathbf{MRTAMLLZTOT}_{z} = \sum_{q} (\max(0, \sum_{i} \sum_{p} \mathbf{RTAML}_{q,p,i}))$$

The above variables are defined as follows:

Variable	Unit	Description
$MRTAMLLZTOT_z$	MWh	*Monthly Real-Time Adjusted Metered Load - Load Zone Total*—The total AML in CMZ z, for the calendar month.
$RTAML_{q,p,i}$	MWh	*Real-Time Adjusted Metered Load per QSE per Settlement Point*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval *i*.
q	none	A QSE.
p	none	A Settlement Point in the 2003 ERCOT CMZ.
i	none	A 15-minute Settlement Interval.
z	none	A 2003 ERCOT CMZ.

[NPRR1030: Insert Section 6.6.2.8 below upon system implementation:]

6.6.2.8 QSE DC Tie Export Load Ratio Share by Congestion Management Zone for a Month

(1) Each QSE's DC Tie Export DCMLRSZ by CMZ for a calendar month is calculated as follows:

$$\mathbf{DCMLRSZ}_{q,z} = \max(0, \sum_{i} \sum_{p} \mathbf{RTAMLDC}_{q,p,i}) / \mathbf{MRTAMLLZTOT}_{z}$$

The above variables are defined as follows:

Variable	Unit	Description
$DCMLRSZ_{q,z}$	none	*DC Tie Exports Monthly Load Ratio Share Zonal per QSE*—The ratio share calculated for QSE *q* with DC Tie exports by CMZ *z* for the calendar month.
$RTAMLDC_{q,p,i}$	MWh	*Real-Time Adjusted Metered Load for DC Ties per Settlement Point per QSE*—The sum of the DC Tie AML at the Electrical Buses that are included in Settlement Point *p*, represented by QSE *q*, for the 15-minute Settlement Interval *i*.
$MRTAMLLZTOT_z$	MWh	*Monthly Real-Time Adjusted Metered Load - Load Zone Total*—The total AML in CMZ z, for the calendar month.
q	none	A QSE.
p	none	A Settlement Point in the 2003 ERCOT CMZ.
i	none	A 15-minute Settlement Interval.
z	none	A 2003 ERCOT CMZ.

6.6.3 Real-Time Energy Charges and Payments

6.6.3.1 Real-Time Energy Imbalance Payment or Charge at a Resource Node

(1) The payment or charge to each QSE for Energy Imbalance Service is calculated based on the Real-Time Settlement Point Price for the following amounts at a particular Resource Node Settlement Point:

(a) The energy produced by all its Generation Resources, consumed as WSL, or consumed as Non-WSL ESR Charging Load at the Settlement Point; plus

(b) The amount of its Self-Schedules with sink specified at the Settlement Point; plus

(c) The amount of its Day-Ahead Market (DAM) Energy Bids cleared in the DAM at the Settlement Point; plus

(d) The amount of its Energy Trades at the Settlement Point where the QSE is the buyer; minus

(e) The amount of its Self-Schedules with source specified at the Settlement Point; minus

(f) The amount of its energy offers cleared in the DAM at the Settlement Point; minus

(g) The amount of its Energy Trades at the Settlement Point where the QSE is the seller.

(2) The payment or charge to each QSE for Energy Imbalance Service at a Resource Node Settlement Point for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMT}_{q,p} = \mathbf{(-1)} * \{ \sum_{gsc} (\sum_{r} \mathbf{(RESREV}_{q,r,gsc,p}\mathbf{)}) + (\sum_{r} \mathbf{WSLAMTTOT}_{q,r,p}\mathbf{)} + (\sum_{r} \mathbf{ESRNWSLAMTTOT}_{q,r,p}\mathbf{)} + \mathbf{RTSPP}_{p} * \mathbf{[(SSSK}_{q,p} * \mathbf{¼) + (DAEP}_{q,p} * \mathbf{¼) + (RTQQEP}_{q,p} * \mathbf{¼) - (SSSR}_{q,p} * \mathbf{¼) - (DAES}_{q,p} * \mathbf{¼) - (RTQQES}_{q,p} * \mathbf{¼)]} \}$$

Where:

$$\text{RESREV}_{q,r,gsc,p} = \text{GSPLITPER}_{q,r,gsc,p} * \text{NMSAMTTOT}_{gsc}$$

$$\text{RESMEB}_{q,r,gsc,p} = \text{GSPLITPER}_{q,r,gsc,p} * \text{NMRTETOT}_{gsc}$$

$$\text{WSLTOT}_{q,p} = \sum_{r} (\sum_{b} \text{MEBL}_{q,r,b})$$

$$\text{ESRNWSLTOT}_{q,p} = \sum_{r} (\sum_{b} \text{MEBR}_{q,r,b})$$

$$RNIMBAL_{q,p} = \sum_{gsc}\left(\sum_{r} RESMEB_{q,r,gsc,p}\right) + WSLTOT_{q,p} + ESRNWSLTOT_{q,p} + (SSSK_{q,p} * ¼) + (DAEP_{q,p} * ¼) + (RTQQEP_{q,p} * ¼) - (SSSR_{q,p} * ¼) - (DAES_{q,p} * ¼) - (RTQQES_{q,p} * ¼)$$

The above variables are defined as follows:

Variable	Unit	Description
$RTEIAMT_{q,p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The payment or charge to QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
$RNIMBAL_{q,p}$	MWh	*Resource Node Energy Imbalance per QSE per Settlement Point*—The Resource Node volumetric imbalance for QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
$RTSPP_{p}$	$/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.
$SSSK_{q,p}$	MW	*Self-Schedule with Sink at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with sink at Settlement Point *p*, for the 15-minute Settlement Interval.
$DAEP_{q,p}$	MW	*Day-Ahead Energy Purchase per QSE per Settlement Point*—The QSE *q*'s DAM Energy Bids at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
$RTQQEP_{q,p}$	MW	*Real-Time QSE-to-QSE Energy Purchase per QSE per Settlement Point*—The amount of MW bought by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
$SSSR_{q,p}$	MW	*Self-Schedule with Source at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with source at Settlement Point *p*, for the 15-minute Settlement Interval.
$DAES_{q,p}$	MW	*Day-Ahead Energy Sale per QSE per Settlement Point*—The QSE *q*'s energy offers at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
$RTQQES_{q,p}$	MW	*Real-Time QSE-to-QSE Energy Sale per QSE per Settlement Point*—The amount of MW sold by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
$RESREV_{q,r,gsc,p}$	$	*Resource Share Revenue Settlement Payment*—The Resource share of the total payment to the entire Facility with a net metering arrangement attributed to Resource *r* that is part of a generation site code *gsc* for the QSE *q* at Settlement Point *p*.
$RESMEB_{q,r,gsc,p}$	MWh	*Resource Share Net Meter Real-Time Energy Total*—The Resource share of the net sum for all Settlement Meters attributed to Resource *r* that is part of a generation site code *gsc* for the QSE *q* at Settlement Point *p*.
$WSLTOT_{q,p}$	MWh	*WSL Total*—The total WSL energy metered by the Settlement Meters which measure WSL for the QSE *q* at Settlement Point *p*.
$ESRNWSLTOT_{q,p}$	MWh	*ESR Non-WSL Total*—The total energy metered by the Settlement Meters which measures Non-WSL ESR Charging Load for the QSE *q* at Settlement Point *p*.

Variable	Unit	Description
MEBL $_{q,r,b}$	MWh	*Metered Energy for Wholesale Storage Load at 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 Non-WSL ESR Charging Load for the 15-minute Settlement Interval represented as a negative value, for the QSE *q*, Resource *r*, at bus *b*.
NMSAMTTOT $_{gsc}$	$	*Net Metering Settlement*—The total payment or charge to a generation site with a net metering arrangement.
WSLAMTTOT $_{q, r, p}$	$	*Wholesale Storage Load Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for WSL for each 15-minute Settlement Interval.
ESRNWSLAMTTOT $_{q, r, p}$	$	*Energy Storage Resource Non-WSL Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for Non-WSL ESR Charging Load for each 15-minute Settlement Interval.
NMRTETOT $_{gsc}$	MWh	*Net Meter Real-Time Energy Total*—The net sum for all Settlement Meters included in generation site code *gsc*. A positive value indicates an injection of power to the ERCOT System.
GSPLITPER $_{q, r, gsc, p}$	none	*Generation Resource SCADA Splitting Percentage*—The generation allocation percentage for Resource *r* that is part of a net metering arrangement. GSPLITPER is calculated by taking the Supervisory Control and Data Acquisition (SCADA) values (GSSPLITSCA) for a particular Generation Resource *r* that is part of a net metering configuration and dividing by the sum of all SCADA values for all Resources that are included in the net metering configuration for each interval. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
q	none	A QSE.
p	none	A Resource Node Settlement Point.
r	none	A Generation Resource or a Controllable Load Resource that is part of an ESR that is located at the Facility with net metering.
gsc	none	A generation site code.
b	none	An Electrical Bus.

[NPRR1014: Replace paragraph (2) above with the following upon system implementation:]

(2) The payment or charge to each QSE for Energy Imbalance Service at a Resource Node Settlement Point for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMT}_{q,p} = (-1) * \{\sum_{gsc}(\sum_{r}(\mathbf{RESREV}_{q,r,gsc,p})) + (\sum_{r}\mathbf{WSLAMTTOT}_{q,r,p}) + (\sum_{r}\mathbf{ESRNWSLAMTTOT}_{q,r,p}) + \mathbf{RTSPP}_{p} * [(\mathbf{SSSK}_{q,p} * ¼) + (\mathbf{DAEP}_{q,p} * ¼) + (\mathbf{RTQQEP}_{q,p} * ¼) - (\mathbf{SSSR}_{q,p} * ¼) - (\mathbf{DAES}_{q,p} * ¼) - (\mathbf{RTQQES}_{q,p} * ¼)]\}$$

Where:

$$RESREV_{q, r, gsc, p} = GSPLITPER_{q, r, gsc, p} * NMSAMTTOT_{gsc}$$

$$RESMEB_{q, r, gsc, p} = GSPLITPER_{q, r, gsc, p} * NMRTETOT_{gsc}$$

$$WSLTOT_{q, p} = \sum_{r} \left(\sum_{b} MEBL_{q,r,b} \right)$$

$$ESRNWSLTOT_{q, p} = \sum_{r} \left(\sum_{b} MEBR_{q, r, b} \right)$$

$$RNIMBAL_{q, p} = \sum_{gsc} \left(\sum_{r} RESMEB_{q, r, gsc, p} \right) + WSLTOT_{q, p} + ESRNWSLTOT_{q, p} + (SSSK_{q, p} * ¼) + (DAEP_{q, p} * ¼) + (RTQQEP_{q, p} * ¼) - (SSSR_{q, p} * ¼) - (DAES_{q, p} * ¼) - (RTQQES_{q, p} * ¼)$$

The above variables are defined as follows:

Variable	Unit	Description
$RTEIAMT_{q, p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The payment or charge to QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
$RNIMBAL_{q, p}$	MWh	*Resource Node Energy Imbalance per QSE per Settlement Point*—The Resource Node volumetric imbalance for QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
$RTSPP_{p}$	$/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.
$SSSK_{q, p}$	MW	*Self-Schedule with Sink at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with sink at Settlement Point *p*, for the 15-minute Settlement Interval.
$DAEP_{q, p}$	MW	*Day-Ahead Energy Purchase per QSE per Settlement Point*—The QSE *q*'s DAM Energy Bids at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
$RTQQEP_{q, p}$	MW	*Real-Time QSE-to-QSE Energy Purchase per QSE per Settlement Point*—The amount of MW bought by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
$SSSR_{q, p}$	MW	*Self-Schedule with Source at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with source at Settlement Point *p*, for the 15-minute Settlement Interval.
$DAES_{q, p}$	MW	*Day-Ahead Energy Sale per QSE per Settlement Point*—The QSE *q*'s energy offers at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
$RTQQES_{q, p}$	MW	*Real-Time QSE-to-QSE Energy Sale per QSE per Settlement Point*—The amount of MW sold by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.

RESREV $_{q, r, gsc, p}$	$	*Resource Share Revenue Settlement Payment*—The Resource share of the total payment to the entire Facility with a net metering arrangement attributed to Resource *r* that is part of a generation site code *gsc* for the QSE *q* at Settlement Point *p*.
RESMEB $_{q, r, gsc, p}$	MWh	*Resource Share Net Meter Real-Time Energy Total*—The Resource share of the net sum for all Settlement Meters attributed to Resource *r* that is part of a generation site code *gsc* for the QSE *q* at Settlement Point *p*.
WSLTOT $_{q, p}$	MWh	*WSL Total*—The total WSL energy metered by the Settlement Meters which measure WSL for the QSE *q* at Settlement Point *p*.
ESRNWSLTOT $_{q, p}$	MWh	*ESR Non-WSL Total*—The total energy metered by the Settlement Meters which measures Non-WSL ESR Charging Load for the QSE *q* at Settlement Point *p*.
MEBL $_{q,r,b}$	MWh	*Metered Energy for Wholesale Storage Load at 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 Non-WSL ESR Charging Load for the 15-minute Settlement Interval represented as a negative value, for the QSE *q*, Resource *r*, at bus *b*.
NMSAMTTOT $_{gsc}$	$	*Net Metering Settlement*—The total payment or charge to a generation site with a net metering arrangement.
WSLAMTTOT $_{q, r, p}$	$	*Wholesale Storage Load Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for WSL for each 15-minute Settlement Interval.
ESRNWSLAMTTOT $_{q, r, p}$	$	*Energy Storage Resource Non-WSL Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for Non-WSL ESR Charging Load for each 15-minute Settlement Interval.
NMRTETOT $_{gsc}$	MWh	*Net Meter Real-Time Energy Total*—The net sum for all Settlement Meters included in generation site code *gsc*. A positive value indicates an injection of power to the ERCOT System.
GSPLITPER $_{q, r, gsc, p}$	none	*Generation Resource SCADA Splitting Percentage*—The generation allocation percentage for Resource *r* that is part of a net metering arrangement. GSPLITPER is calculated by taking the Supervisory Control and Data Acquisition (SCADA) values (GSSPLITSCA) for a particular Generation Resource or ESR *r* that is part of a net metering configuration and dividing by the sum of all SCADA values for all Resources that are included in the net metering configuration for each interval. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
q	none	A QSE.
p	none	A Resource Node Settlement Point.
r	none	A Generation Resource or ESR that is located at the Facility with net metering.
gsc	none	A generation site code.
b	none	An Electrical Bus.

(3) For a facility with Settlement Meters that measure ESR Load, the total payment or charge for ESR Load is calculated for a QSE, ESR, and Settlement Point for each 15-minute Settlement Interval.

The WSL is settled as follows:

$$\mathbf{WSLAMTTOT}_{q,r,p} = \sum_{b} \mathbf{(RTRMPRESR}_{b} * \mathbf{MEBL}_{q,r,b})$$

The Non-WSL ESR Charging Load is settled as follows:

$$\mathbf{ESRNWSLAMTTOT}_{q,r,p} = \sum_{b} \mathbf{(RTRMPRESR}_{b} * \mathbf{MEBR}_{q,r,b})$$

Where the price for Settlement Meter is determined as follows:

$$\mathbf{RTRMPRESR}_{b} = \mathbf{Max\ [-\$251, (}\sum_{y} \mathbf{(RNWFL}_{b,y} * \mathbf{RTLMP}_{b,y}) + \mathbf{RTRSVPOR} + \mathbf{RTRDP)]}$$

Where the weighting factor for the Electrical Bus associated with the meter is:

$$\mathbf{RNWFL}_{b,y} = \mathbf{[Max\ (0.001,}\ \sum_{r} \mathbf{BP}_{r,y}) * \mathbf{TLMP}_{y}\mathbf{]}\ /$$

$$\mathbf{[}\sum_{y} \mathbf{Max\ (0.001,}\ \sum_{r} \mathbf{BP}_{r,y}) * \mathbf{TLMP}_{y}\mathbf{]}$$

Where:

$$\text{RTRSVPOR} = \sum_{y} (\text{RNWF}_{y} * \text{RTORPA}_{y})$$

$$\text{RTRDP} = \sum_{y} (\text{RNWF}_{y} * \text{RTORDPA}_{y})$$

$$\text{RNWF}_{y} = \text{TLMP}_{y} / \sum_{y} \text{TLMP}_{y}$$

The summation is over all ESR Load *r* associated to the individual meter. The determination of which Resources are associated to an individual meter is static and based on the normal system configuration of the generation site code, *gsc*.

The above variables are defined as follows:

Variable	Unit	Description
$\text{RTLMP}_{b,y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP for the meter at Electrical Bus *b*, for the SCED interval *y*.
TLMP_{y}	second	*Duration of SCED interval per interval*—The duration of the SCED interval *y*.
RTRSVPOR	$/MWh	*Real-Time Reserve Price for On-Line Reserves*—The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval.
RTORPA_{y}	$/MWh	*Real-Time On-Line Reserve Price Adder per interval*—The Real-Time On-Line Reserve Price Adder for the SCED interval *y*.

Variable	Unit	Description
RTRDP	$/MWh	*Real-Time On-Line Reliability Deployment Price* —The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder.
$RTORDPA_y$	$/MWh	*Real-Time On-Line Reliability Deployment Price Adder* —The Real-Time Price Adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$MEBL_{q,r,b}$	MWh	*Metered Energy for Wholesale Storage Load at 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 Non-WSL ESR Charging Load for the 15-minute Settlement Interval represented as a negative value, for the QSE *q*, Resource *r*, at bus *b*.
$WSLAMTTOT_{q,r,p}$	$	*Wholesale Storage Load Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for WSL for each 15-minute Settlement Interval.
$ESRNWSLAMTTOT_{q,r,p}$	$	*Energy Storage Resource Non-WSL Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for Non-WSL ESR Charging Load for each 15-minute Settlement Interval.
$RNWFL_{b,y}$	none	*Net meter Weighting Factor per interval for the Energy Metered as Energy Storage Resource Load* —The weight factor used in net meter price calculation for meters in Electrical Bus *b*, for the SCED interval *y*, for the ESR Load associated with an ESR. The weighting factor used in the net meter price calculation shall not be recalculated after the fact due to revisions in the association of Resources to Settlement Meters.
$RTRMPRESR_b$	$/MWh	*Real-Time Price for the Energy Metered as Energy Storage Resource Load at bus*—The Real-Time price for the Settlement Meter which measures ESR Load at Electrical Bus *b*, for the 15-minute Settlement Interval.
$BP_{r,y}$	MW	*Base Point per Resource per interval* - The Base Point of Resource *r*, for the SCED interval *y*.
q	none	A QSE.
gsc	none	A generation site code.
r	none	The Controllable Load Resource that is part of an ESR.
p	none	A Resource Node Settlement Point.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An Electrical Bus.

[NPRR1010 and NPRR1014: Replace applicable portions of paragraph (3) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation for NPRR1014:]

(3) For a facility with Settlement Meters that measure ESR Load, the total payment or charge for ESR Load is calculated for a QSE, ESR, and Settlement Point for each 15-minute Settlement Interval.

The WSL is settled as follows:

$$\mathbf{WSLAMTTOT}_{q,r,p} = \sum_{b} (\mathbf{RTRMPRESR}_{b} * \mathbf{MEBL}_{q,r,b})$$

The Non-WSL ESR Charging Load is settled as follows:

$$\mathbf{ESRNWSLAMTTOT}_{q,r,p} = \sum_{b} (\mathbf{RTRMPRESR}_{b} * \mathbf{MEBR}_{q,r,b})$$

Where the price for Settlement Meter is determined as follows:

$$\mathbf{RTRMPRESR}_{b} = \mathbf{Max}\ [-\$251, (\sum_{y} (\mathbf{RNWFL}_{b,y} * \mathbf{RTLMP}_{b,y}) + \mathbf{RTRDP})]$$

Where the weighting factor for the Electrical Bus associated with the meter is:

$$\mathbf{RNWFL}_{b,y} = [\mathbf{Max}\ (0.001, \mathbf{ABS}(\sum_{r} \mathbf{Min}(0, \mathbf{BP}_{r,y}))) * \mathbf{TLMP}_{y}] / [\sum_{y} \mathbf{Max}\ (0.001, \mathbf{ABS}(\sum_{r} \mathbf{Min}(0, \mathbf{BP}_{r,y}))) * \mathbf{TLMP}_{y}]$$

Where:

$$\text{RTRDP} = \sum_{y} (\text{RNWF}_{y} * \text{RTRDPA}_{y})$$

$$\text{RNWF}_{y} = \text{TLMP}_{y} / \sum_{y} \text{TLMP}_{y}$$

The summation is over all ESR Load *r* associated to the individual meter. The determination of which Resources are associated to an individual meter is static and based on the normal system configuration of the generation site code, *gsc*.

The above variables are defined as follows:

Variable	Unit	Description
$\text{RTLMP}_{b,y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP for the meter at Electrical Bus *b*, for the SCED interval *y*.
TLMP_{y}	second	*Duration of SCED interval per interval*—The duration of the SCED interval *y*.

RTRDP	$/MWh	*Real-Time Reliability Deployment Price for Energy* —The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time Reliability Deployment Price Adder for Energy.
$RTRDPA_y$	$/MWh	*Real-Time Reliability Deployment Price Adder for Energy* —The Real-Time price adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$RNWF_y$	none	*Resource Node Weighting Factor per interval*—The weight used in the Real-Time Reliability Deployment price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$MEBL_{q,r,b}$	MWh	*Metered Energy for Wholesale Storage Load at 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 Non-WSL ESR Charging Load for the 15-minute Settlement Interval represented as a negative value, for the QSE *q*, Resource *r*, at bus *b*.
$WSLAMTTOT_{q,r,p}$	$	*Wholesale Storage Load Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for WSL for each 15-minute Settlement Interval.
$ESRNWSLAMTTOT_{q,r,p}$	$	*Energy Storage Resource Non-WSL Settlement*—The total payment or charge to QSE *q*, Resource *r*, at Settlement Point *p*, for Non-WSL ESR Charging Load for each 15-minute Settlement Interval.
$RNWFL_{b,y}$	none	*Net meter Weighting Factor per interval for the Energy Metered as Energy Storage Resource Load* —The weight factor used in net meter price calculation for meters in Electrical Bus *b*, for the SCED interval *y*, for the ESR Load associated with an ESR. The weighting factor used in the net meter price calculation shall not be recalculated after the fact due to revisions in the association of Resources to Settlement Meters.
$RTRMPRESR_b$	$/MWh	*Real-Time Price for the Energy Metered as Energy Storage Resource Load at bus*—The Real-Time price for the Settlement Meter which measures ESR Load at Electrical Bus *b*, for the 15-minute Settlement Interval.
$BP_{r,y}$	MW	*Base Point per Resource per interval* - The Base Point of Resource *r*, for the SCED interval *y*.
q	none	A QSE.
gsc	none	A generation site code.
r	none	An ESR.
p	none	A Resource Node Settlement Point.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An Electrical Bus.

(4) The total payment or charge to a Facility with a net metering arrangement for each 15-minute Settlement Interval shall be calculated as follows:

$$\mathbf{NMRTETOT}_{gsc} = \mathbf{Max}\ (0, (\sum_{b} (\mathbf{MEB}_{gsc,b} + \mathbf{MEBC}_{gsc,b})))$$

If $NMRTETOT_{gsc} = 0$ for a 15-minute Settlement Interval, then

The Load that is not WSL is included in the Real-Time AML per QSE.

Otherwise, when $NMRTETOT_{gsc} > 0$ for a 15-minute Settlement Interval, then

$$\mathbf{NMSAMTTOT}_{gsc} = \sum_{b} [(\mathbf{RTRMPR}_{b} * \mathbf{MEB}_{gsc,b}) + (\mathbf{RTRMPR}_{b} * \mathbf{MEBC}_{gsc,b})]$$

Where the price for Settlement Meter is determined as follows:

$$\mathbf{RTRMPR}_{b} = \mathbf{Max}\ [-\$251, (\sum_{y} (\mathbf{RNWF}_{b,y} * \mathbf{RTLMP}_{b,y}) + \mathbf{RTRSVPOR} + \mathbf{RTRDP})]$$

Where the weighting factor for the Electrical Bus associated with the meter is:

$$\mathbf{RNWF}_{b,y} = [\mathbf{Max}\ (0.001, \sum_{r} \mathbf{BP}_{r,y}) * \mathbf{TLMP}_{y}] / [\sum_{y} \mathbf{Max}\ (0.001, \sum_{r} \mathbf{BP}_{r,y}) * \mathbf{TLMP}_{y}]$$

Where:

$$RTRSVPOR = \sum_{y} (RNWF_{y} * RTORPA_{y})$$

$$RTRDP = \sum_{y} (RNWF_{y} * RTORDPA_{y})$$

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The summation is over all Resources *r* associated to the individual meter. The determination of which Resources are associated to an individual meter is static and based on the normal system configuration of the generation site code, *gsc*.

The above variables are defined as follows:

Variable	Unit	Description
$NMRTETOT_{gsc}$	MWh	*Net Meter Real-Time Energy Total*—The net sum for all Settlement Meters included in generation site code *gsc*. A positive value indicates an injection of power to the ERCOT System.
$NMSAMTTOT_{gsc}$	$	*Net Metering Settlement*—The total payment or charge to a generation site with a net metering arrangement.

Variable	Unit	Description
RTRMPR $_{b}$	$/MWh	*Real-Time Price for the Energy Metered for each Resource meter at bus*—The Real-Time price for the Settlement Meter at Electrical Bus *b*, for the 15-minute Settlement Interval.
MEB $_{gsc, b}$	MWh	*Metered Energy at bus*— The metered energy by the Settlement Meter which is not upstream from another Settlement Meter which measures ESR Load for the 15-minute Settlement Interval. A positive value represents energy produced, and a negative value represents energy withdrawn.
RTRSVPOR	$/MWh	*Real-Time Reserve Price for On-Line Reserves*—The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval.
RTORPA $_{y}$	$/MWh	*Real-Time On-Line Reserve Price Adder per interval*—The Real-Time On-Line Reserve Price Adder for the SCED interval *y*.
RTRDP	$/MWh	*Real-Time On-Line Reliability Deployment Price* —The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder.
RTORDPA $_{y}$	$/MWh	*Real-Time On-Line Reliability Deployment Price Adder* —The Real-Time Price Adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
RNWF $_{y}$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
RTLMP $_{b, y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP for the meter at Electrical Bus *b*, for the SCED interval *y*.
TLMP $_{y}$	second	*Duration of SCED interval per interval*—The duration of the SCED interval *y*.
RNWF $_{b, y}$	none	*Net meter Weighting Factor per interval*—The weight factor used in net meter price calculation for meters in Electrical Bus *b*, for the SCED interval *y*. The weighting factor used in the net meter price calculation shall not be recalculated after the fact due to revisions in the association of Resources to Settlement Meters.
BP $_{r, y}$	MW	*Base Point per Resource per interval*—The Base Point of Resource *r*, for the SCED interval *y*. Where for a Combined Cycle Train, the Resource *r* is a Combined Cycle Generation Resource within the Combined Cycle Train.
MEBC $_{gsc, b}$	MWh	*Metered Energy at bus (Calculated)*— The calculated energy for the 15-minute Settlement Interval for a Settlement Meter which is upstream from another Settlement Meter which measures ESR Load. A positive value represents energy produced, and a negative value represents energy withdrawn.
gsc	none	A generation site code.
r	none	A Generation Resource that is located at the Facility with net metering.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An Electrical Bus.

[NPRR1010 and NPRR1014: Replace applicable portions of paragraph (4) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation for NPRR1014:]

(4) The total payment or charge to a Facility with a net metering arrangement for each 15-minute Settlement Interval shall be calculated as follows:

$$\mathbf{NMRTETOT}_{gsc} = \mathbf{Max}\left(0, \left(\sum_{b} \left(\mathbf{MEB}_{gsc,b} + \mathbf{MEBC}_{gsc,b}\right)\right)\right)$$

If $NMRTETOT_{gsc} = 0$ for a 15-minute Settlement Interval, then

The Load that is not WSL is included in the Real-Time AML per QSE.

Otherwise, when $NMRTETOT_{gsc} > 0$ for a 15-minute Settlement Interval, then

$$\mathbf{NMSAMTTOT}_{gsc} = \sum_{b} \left[\left(\mathbf{RTRMPR}_{b} * \mathbf{MEB}_{gsc,b}\right) + \left(\mathbf{RTRMPR}_{b} * \mathbf{MEBC}_{gsc,b}\right)\right]$$

Where the price for Settlement Meter is determined as follows:

$$\mathbf{RTRMPR}_{b} = \mathbf{Max}\left[-\$251, \left(\sum_{y} \left(\mathbf{RNWF}_{b,y} * \mathbf{RTLMP}_{b,y}\right) + \mathbf{RTRDP}\right)\right]$$

Where the weighting factor for the Electrical Bus associated with the meter is:

$$\mathbf{RNWF}_{b,y} = \left[\mathbf{Max}\left(0.001, \sum_{r} \mathbf{Max}\left(0, \mathbf{BP}_{r,y}\right)\right) * \mathbf{TLMP}_{y}\right] / \left[\sum_{y} \mathbf{Max}\left(0.001, \sum_{r} \mathbf{Max}\left(0, \mathbf{BP}_{r,y}\right)\right) * \mathbf{TLMP}_{y}\right]$$

Where:

$$RTRDP = \sum_{y} \left(RNWF_{y} * RTRDPA_{y}\right)$$

$$RNWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The summation is over all Resources *r* associated to the individual meter. The determination of which Resources are associated to an individual meter is static and based on the normal system configuration of the generation site code, *gsc*.

The above variables are defined as follows:

Variable	Unit	Description
NMRTETOT $_{gsc}$	MWh	*Net Meter Real-Time Energy Total*—The net sum for all Settlement Meters included in generation site code *gsc*. A positive value indicates an injection of power to the ERCOT System.
NMSAMTTOT $_{gsc}$	$	*Net Metering Settlement*—The total payment or charge to a generation site with a net metering arrangement.
RTRMPR $_{b}$	$/MWh	*Real-Time Price for the Energy Metered for each Resource meter at bus*—The Real-Time price for the Settlement Meter at Electrical Bus *b*, for the 15-minute Settlement Interval.
MEB $_{gsc, b}$	MWh	*Metered Energy at bus*—The metered energy by the Settlement Meter which is not upstream from another Settlement Meter which measures ESR Load for the 15-minute Settlement Interval. A positive value represents energy produced, and a negative value represents energy withdrawn.
RTRDP	$/MWh	*Real-Time Reliability Deployment Price for Energy*—The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time Reliability Deployment Price Adder for Energy.
RTRDPA $_{y}$	$/MWh	*Real-Time Reliability Deployment Price Adder for Energy* —The Real-Time price adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
RNWF $_{y}$	none	*Resource Node Weighting Factor per interval*—The weight used in the Resource Node Settlement Point Price calculation for the portion of the SCED interval *y* within the Settlement Interval.
RTLMP $_{b, y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP for the meter at Electrical Bus *b*, for the SCED interval *y*.
TLMP $_{y}$	second	*Duration of SCED interval per interval*—The duration of the SCED interval *y*.
RNWF $_{b, y}$	none	*Net meter Weighting Factor per interval*—The weight factor used in net meter price calculation for meters in Electrical Bus *b*, for the SCED interval *y*. The weighting factor used in the net meter price calculation shall not be recalculated after the fact due to revisions in the association of Resources to Settlement Meters.
BP $_{r, y}$	MW	*Base Point per Resource per interval*—The Base Point of Resource *r*, for the SCED interval *y*. Where for a Combined Cycle Train, the Resource *r* is a Combined Cycle Generation Resource within the Combined Cycle Train.
MEBC $_{gsc, b}$	MWh	*Metered Energy at bus (Calculated)* — The calculated energy for the 15-minute Settlement Interval for a Settlement Meter which is upstream from another Settlement Meter which measures ESR Load. A positive value represents energy produced, and a negative value represents energy withdrawn.
gsc	none	A generation site code.
r	none	A Generation Resource or ESR that is located at the Facility with net metering.
y	none	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.
b	none	An Electrical Bus.

(5) The Generation Resource SCADA Splitting Percentage for each Resource within a net metering arrangement for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{GSPLITPER}_{q,\ r,\ gsc,\ p} = \mathbf{GSSPLITSCA}_{r} \Big/ \sum_{r} \mathbf{GSSPLITSCA}_{r}$$

The above variables are defined as follows:

Variable	Unit	Definition
GSPLITPER $_{q, r, gsc, p}$	none	*Generation Resource SCADA Splitting Percentage*—The generation allocation percentage for Resource *r* that is part of a generation site code *gsc* for the QSE *q* at Settlement Point *p*. GSPLITPER is calculated by taking the SCADA values (GSSPLITSCA) for a particular Generation Resource *r* that is part of a net metering configuration and dividing by the sum of all SCADA values for all Resources that are included in the net metering configuration for each interval. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
GSSPLITSCA $_{r}$	MWh	*Generation Resource SCADA Net Real Power provided via Telemetry*—The net real power provided via telemetry per Resource within the net metering arrangement, integrated for the 15-minute Settlement Interval. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
gsc	none	A generation site code.
r	none	A Generation Resource that is located at the Facility with net metering.
q	none	A QSE.
p	none	A Resource Node Settlement Point.

[NPRR1014: Replace paragraph (5) above with the following upon system implementation:]

(5) The Generation Resource or ESR SCADA Splitting Percentage for each Resource within a net metering arrangement for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{GSPLITPER}_{q,\ r,\ gsc,\ p} = \mathbf{GSSPLITSCA}_{r} \Big/ \sum_{r} \mathbf{GSSPLITSCA}_{r}$$

The above variables are defined as follows:

Variable	Unit	Definition
GSPLITPER $_{q, r, gsc, p}$	none	*Generation Resource SCADA Splitting Percentage*—The generation allocation percentage for Resource *r* that is part of a generation site code *gsc* for the QSE *q* at Settlement Point *p*. GSPLITPER is calculated by taking the SCADA values (GSSPLITSCA) for a particular Generation Resource or ESR *r* that is part of a net metering configuration and dividing by the sum of all SCADA values for all Resources that are included in the net metering configuration for each interval. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.

GSSPLITSCA $_r$	MWh	*Generation Resource SCADA Net Real Power provided via Telemetry*—The net real power provided via telemetry per Resource within the net metering arrangement, integrated for the 15-minute Settlement Interval. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train.
gsc	none	A generation site code.
r	none	A Generation Resource or ESR that is located at the Facility with net metering.
q	none	A QSE.
p	none	A Resource Node Settlement Point.

(6) The total net payments and charges to each QSE for Energy Imbalance Service at all Resource Node Settlement Points for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMTQSETOT}_{q} = \sum_{p} \mathbf{RTEIAMT}_{q,p}$$

The above variables are defined as follows:

Variable	Unit	Definition
RTEIAMTQSETOT $_q$	$	*Real-Time Energy Imbalance Amount QSE Total per QSE*—The total net payments and charges to QSE *q* for Real-Time Energy Imbalance Service at all Resource Node Settlement Points for the 15-minute Settlement Interval.
RTEIAMT $_{q,p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The payment or charge to QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Resource Node Settlement Point.

6.6.3.2 Real-Time Energy Imbalance Payment or Charge at a Load Zone

(1) The payment or charge to each QSE for Energy Imbalance Service is calculated based on the Real-Time Settlement Point Price for the following amounts at a particular Load Zone Settlement Point:

(a) The amount of its Self-Schedules with sink specified at the Settlement Point; plus

(b) The amount of its DAM Energy Bids cleared in the DAM at the Settlement Point; plus

(c) The amount of its Energy Trades at the Settlement Point where the QSE is the buyer; minus

(d) The amount of its Self-Schedules with source specified at the Settlement Point; minus

(e) The amount of its energy offers cleared in the DAM at the Settlement Point; minus

(f) The amount of its Energy Trades at the Settlement Point where the QSE is the seller; minus

(g) Its AML at the Settlement Point excluding Non-WSL ESR Charging Load; plus

(h) The aggregated generation of its Settlement Only Transmission Self-Generators (SOTSGs) at the Settlement Point. SOTSG sites will be represented as a single unit in the ERCOT Settlement system.

(i) The aggregated generation of its Settlement Only Distribution Generators (SODGs) and Settlement Only Transmission Generators (SOTGs) that have elected to retain Load Zone pricing in accordance with Section 6.6.3.8, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG) or a Settlement Only Transmission Generator (SOTG). SODG and SOTG sites will be represented as a single unit in the ERCOT Settlement system.

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

(i) The aggregated generation of its Settlement Only Distribution Generators (SODGs) and Settlement Only Transmission Generators (SOTGs) that have elected to retain Load Zone pricing in accordance with Section 6.6.3.8, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG), Settlement Only Transmission Generator (SOTG), Settlement Only Distribution Energy Storage System (SODESS), or Settlement Only Transmission Energy Storage System (SOTESS). SODG, SOTG, Settlement Only Distribution Energy Storage System (SODESS), and Settlement Only Transmission Energy Storage System (SOTESS) sites will be represented as a single unit in the ERCOT Settlement system.

(j) The aggregated generation of its Energy Storage System (ESS) SODGs and SOTGs at sites where the ESS capacity constitutes more than 50% of the total SODG or SOTG nameplate capacity, as confirmed by an affidavit submitted by the Resource Entity for the site. SODG and SOTG sites will be represented as a single unit in the ERCOT Settlement system.

(2) The payment or charge to each QSE for Energy Imbalance Service at a Load Zone for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMT}_{q,p} = \mathbf{(-1) * \left\{\left[RTSPP_{p} * \left[(SSSK_{q,p} * ¼) + (DAEP_{q,p} * ¼) + (RTQQEP_{q,p} * ¼) - (SSSR_{q,p} * ¼) - (DAES_{q,p} * ¼) - (RTQQES_{q,p} * ¼)\right]\right] + \left[RTSPPEW_{p} * (RTMGSOGZ_{q,p} - (RTAML_{q,p} - RTAMLESRNW_{q,p}))\right]\right\}}$$

[NPRR995: Replace the formula "RTEIAMT $_{q,p}$" above with the following upon system implementation:]

$$\mathbf{RTEIAMT}_{q,p} = \mathbf{(-1) * \{[RTSPP}_{p} \mathbf{* [(SSSK}_{q,p} \mathbf{* ¼) + (DAEP}_{q,p} \mathbf{* ¼) + (RTQQEP}_{q,p} \mathbf{* ¼) – (SSSR}_{q,p} \mathbf{* ¼) – (DAES}_{q,p} \mathbf{* ¼) – (RTQQES}_{q,p} \mathbf{* ¼)]] + [RTSPPEW}_{p} \mathbf{* (RTMGSOGZ}_{q,p} \mathbf{– (RTAML}_{q,p} \mathbf{– RTAMLESRNW}_{q,p} \mathbf{– RTAMLNWSOL}_{q,p}\mathbf{))]\}}$$

And

$$\mathbf{LZIMBAL}_{q,p} = \mathbf{(SSSK}_{q,p} \mathbf{* ¼) + (DAEP}_{q,p} \mathbf{* ¼) + (RTQQEP}_{q,p} \mathbf{* ¼) – (SSSR}_{q,p} \mathbf{* ¼) – (DAES}_{q,p} \mathbf{* ¼) – (RTQQES}_{q,p} \mathbf{* ¼) – (RTAML}_{q,p} \mathbf{– RTAMLESRNW}_{q,p}\mathbf{) + RTMGSOGZ}_{q,p}$$

[NPRR995: Replace the formula "LZIMBAL $_{q,p}$" above with the following upon system implementation:]

$$\mathbf{LZIMBAL}_{q,p} = \mathbf{(SSSK}_{q,p} \mathbf{* ¼) + (DAEP}_{q,p} \mathbf{* ¼) + (RTQQEP}_{q,p} \mathbf{* ¼) – (SSSR}_{q,p} \mathbf{* ¼) – (DAES}_{q,p} \mathbf{* ¼) – (RTQQES}_{q,p} \mathbf{* ¼) – (RTAML}_{q,p} \mathbf{– RTAMLESRNW}_{q,p} \mathbf{– RTAMLNWSOL}_{q,p}\mathbf{) + RTMGSOGZ}_{q,p}$$

The above variables are defined as follows:

Variable	Unit	Description
RTEIAMT $_{q,p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The payment or charge to QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
RTSPP $_{p}$	$/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.
LZIMBAL $_{q,p}$	MWh	*Load Zone Energy Imbalance per QSE per Settlement Point*—The Load Zone volumetric imbalance for QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
RTSPPEW $_{p}$	$/MWh	*Real-Time Settlement Point Price Energy-Weighted*—The Real-Time Settlement Point Price at the Settlement Point *p*, for the 15-minute Settlement Interval that is weighted by the State Estimated Load for the Load Zone of each SCED interval within the 15-minute Settlement Interval.
RTAML $_{q,p}$	MWh	*Real-Time Adjusted Metered Load per QSE per Settlement Point*—The sum of the AML at the Electrical Buses that are included in Settlement Point *p* represented by QSE *q* for the 15-minute Settlement Interval.
RTAMLESRNW $_{q,p}$	MWh	*Real-Time Adjusted Metered Load for ESR Non-WSL per QSE per Settlement Point*—The sum of the AML for the Non-WSL ESR Charging Load at the

Variable	Unit	Description
		Electrical Buses that are included in Settlement Point *p* represented by QSE *q* for the 15-minute Settlement Interval, represented as a positive value.

[NPRR995: Insert the variable "RTAMLNWSOL $_{q, p}$" below upon system implementation:]

RTAMLNWSOL $_{q, p}$	MWh	*Real-Time Adjusted Metered Load for Non-WSL Settlement Only Charging Load per QSE per Settlement Point*—The sum of the AML for the Non-WSL Settlement Only Charging Load for the SODESS or SOTESS site that are included in Settlement Point *p* represented by QSE *q* for the 15-minute Settlement Interval, represented as a positive value.
SSSK $_{q, p}$	MW	*Self-Schedule with Sink at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with sink at Settlement Point *p*, for the 15-minute Settlement Interval.
DAEP $_{q, p}$	MW	*Day-Ahead Energy Purchase per QSE per Settlement Point*—The QSE *q*'s DAM Energy Bids at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
RTQQEP $_{q, p}$	MW	*Real-Time QSE-to-QSE Energy Purchase per QSE per Settlement Point*—The amount of MW bought by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
SSSR $_{q, p}$	MW	*Self-Schedule with Source at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with source at Settlement Point *p*, for the 15-minute Settlement Interval.
DAES $_{q, p}$	MW	*Day-Ahead Energy Sale per QSE per Settlement Point*—The QSE *q*'s energy offers at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
RTQQES $_{q, p}$	MW	*Real-Time QSE-to-QSE Energy Sale per QSE per Settlement Point*—The amount of MW sold by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
RTMGSOGZ $_{q, p}$	MWh	*Real-Time Metered Generation from Settlement Only Generators Zonal per QSE per Settlement Point*—The total Real-Time energy produced by SOTSGs represented by QSE *q* in Load Zone Settlement Point *p*, for the 15-minute Settlement Interval. MWh quantities for ESS SODGs and SOTGs at sites where the ESS capacity constitutes more than 50% of the total SOG nameplate capacity will be included in this value. MWh quantities for SODGs and SOTGs that have opted out of nodal pricing pursuant to Section 6.6.3.8 will also be included in this value.
q	none	A QSE.
p	none	A Load Zone Settlement Point.

(3) The total net payments and charges to each QSE for Energy Imbalance Service at all Load Zones for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMTQSETOT}_{q} = \sum_{p} \mathbf{RTEIAMT}_{q, p}$$

The above variables are defined as follows:

Variable	Unit	Definition

RTEIAMTQSETOT $_q$	$	*Real-Time Energy Imbalance Amount QSE Total per QSE*—The total net payments and charges to QSE *q* for Real-Time Energy Imbalance Service at all Load Zone Settlement Points for the 15-minute Settlement Interval.
RTEIAMT $_{q, p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The charge to QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Load Zone Settlement Point.

6.6.3.3 Real-Time Energy Imbalance Payment or Charge at a Hub

(1) The payment or charge to each QSE for Energy Imbalance Service is calculated based on the Real-Time Settlement Point Price for the following amounts at a particular Hub Settlement Point:

(a) The amount of its Self-Schedules with sink specified at the Settlement Point; plus

(b) The amount of its DAM Energy Bids cleared in the DAM at the Settlement Point; plus

(c) The amount of its Energy Trades at the Settlement Point where the QSE is the buyer; minus

(d) The amount of its Self-Schedules with source specified at the Settlement Point; minus

(e) The amount of its energy offers cleared in the DAM at the Settlement Point; minus

(f) The amount of its Energy Trades at the Settlement Point where the QSE is the seller.

(2) The payment or charge to each QSE for Energy Imbalance Service at a Hub for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMT}_{q,p} = \mathbf{(-1) * RTSPP}_{p} * \{\mathbf{(SSSK}_{q,p} * ¼) + \mathbf{(DAEP}_{q,p} * ¼) + \mathbf{(RTQQEP}_{q,p} * ¼) - \mathbf{(SSSR}_{q,p} * ¼) - \mathbf{(DAES}_{q,p} * ¼) - \mathbf{(RTQQES}_{q,p} * ¼)\}$$

And

$$\mathbf{HBIMBAL}_{q,p} = \mathbf{(SSSK}_{q,p} * ¼) + \mathbf{(DAEP}_{q,p} * ¼) + \mathbf{(RTQQEP}_{q,p} * ¼) - \mathbf{(SSSR}_{q,p} * ¼) - \mathbf{(DAES}_{q,p} * ¼) - \mathbf{(RTQQES}_{q,p} * ¼)$$

The above variables are defined as follows:

Variable	Unit	Description
RTEIAMT $_{q, p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The payment or charge to QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
HBIMBAL $_{q, p}$	MWh	*Hub Energy Imbalance per QSE per Settlement Point*—The Hub volumetric imbalance for QSE *q* for Real-Time Energy Imbalance Service at Settlement Point *p*, for the 15-minute Settlement Interval.
RTSPP $_{p}$	$/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.
SSSK $_{q, p}$	MW	*Self-Schedule with Sink at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with sink at Settlement Point *p*, for the 15-minute Settlement Interval.
DAEP $_{q, p}$	MW	*Day-Ahead Energy Purchase per QSE per Settlement Point*—The QSE *q*'s DAM Energy Bids at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
RTQQEP $_{q, p}$	MW	*Real-Time QSE-to-QSE Energy Purchase per QSE per Settlement Point*—The amount of MW bought by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
SSSR $_{q, p}$	MW	*Self-Schedule with Source at Settlement Point per QSE per Settlement Point*—The QSE *q*'s Self-Schedule with source at Settlement Point *p*, for the 15-minute Settlement Interval.
DAES $_{q, p}$	MW	*Day-Ahead Energy Sale per QSE per Settlement Point*—The QSE *q*'s Energy Offers at Settlement Point *p* cleared in the DAM, for the hour that includes the 15-minute Settlement Interval.
RTQQES $_{q, p}$	MW	*Real-Time QSE-to-QSE Energy Sale per QSE per Settlement Point*—The amount of MW sold by QSE *q* through Energy Trades at Settlement Point *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Hub Settlement Point.

(3) The total net payments and charges to each QSE for Energy Imbalance Service at all Hubs for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEIAMTQSETOT}_{q} = \sum_{p} \mathbf{RTEIAMT}_{q, p}$$

The above variables are defined as follows:

Variable	Unit	Definition
RTEIAMTQSETOT $_{q}$	$	*Real-Time Energy Imbalance Amount QSE Total per QSE*—The total net payments and charges to QSE *q* for Real-Time Energy Imbalance at all Hub Settlement Points for the 15-minute Settlement Interval.
RTEIAMT $_{q, p}$	$	*Real-Time Energy Imbalance Amount per QSE per Settlement Point*—The charge to QSE *q* for the Real-Time Energy Imbalance at Settlement Point *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Hub Settlement Point.

6.6.3.4 Real-Time Energy Payment for DC Tie Import

(1) The payment to each QSE for energy imported into the ERCOT System through each DC Tie is calculated based on the Real-Time Settlement Point Price at the DC Tie Settlement Point. The payment for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTDCIMPAMT}_{q,p} = \mathbf{(-1) * RTSPP}_{p} \mathbf{* (RTDCIMP}_{q,p} \mathbf{* ¼)}$$

The above variables are defined as follows:

Variable	Unit	Description
$RTDCIMPAMT_{q,p}$	$	*Real-Time DC Import Amount per QSE per Settlement Point*—The payment to QSE *q* for DC Tie import through DC Tie *p*, for the 15-minute Settlement Interval.
$RTSPP_{p}$	$/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.
$RTDCIMP_{q,p}$	MW	*Real-Time DC Import per QSE per Settlement Point*—The aggregated DC Tie Schedule submitted by QSE *q* as an importer into the ERCOT System through DC Tie *p*, for the 15-minute Settlement Interval. ***[NPRR1032: Replace the description above with the following upon system implementation:]*** *Real-Time DC Import per QSE per Settlement Point*—The aggregated final, approved DC Tie Schedule submitted by QSE *q* as an importer into the ERCOT System through DC Tie *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A DC Tie Settlement Point.

(2) ERCOT shall pay each QSE for energy imported into the ERCOT System during a declared Emergency Condition through each DC Tie in response to an ERCOT Dispatch Instruction. The payment for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTEDCIMPAMT}_{q,p} = \mathbf{(-1) * Max \{RTSPP}_{p}\mathbf{, (VEEPDCTP}_{q,p} \mathbf{* CAEDCT)\} * (RTEDCIMP}_{q,p} \mathbf{* ¼)}$$

The above variables are defined as follows:

Variable	Unit	Description
$RTEDCIMPAMT_{q,p}$	$	*Real-Time Emergency DC Import Amount per QSE per Settlement Point*—The payment to QSE *q* for emergency DC Tie import through DC Tie *p*, for the 15-minute Settlement Interval.
$RTSPP_{p}$	$/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.
FIP	$/MMBtu	*Fuel Index Price*—As defined in Section 2, Definitions and Acronyms.
$RTEDCIMP_{q,p}$	MW	*Real-Time Emergency DC Import per QSE per Settlement Point*—The aggregated DC Tie Schedule for emergency energy imported by QSE *q* into the ERCOT System during Emergency Conditions through DC Tie *p*, for the 15-minute Settlement Interval.

VEEPDCTP $_{q, p}$	$/MWh	*Verified Emergency Energy Price at DC Tie Point*—The ERCOT verified cost for the energy imported by QSE *q* into the ERCOT System during declared Emergency Condition through a DC Tie *p* as instructed by a Dispatch Instruction.
CAEDCT	#	*Cost Adder for Emergency DC Tie Import*—A multiplier of 1.10.
q	none	A QSE.
p	none	A DC Tie Settlement Point.

(3) The total of the payments to each QSE for all energy imported into the ERCOT System through DC Ties for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTDCIMPAMTQSETOT}_{q,p} = \sum_{p} \mathbf{(RTDCIMPAMT}_{q,p} \mathbf{+ RTEDCIMPAMT}_{q,p}\mathbf{)}$$

The above variables are defined as follows:

Variable	Unit	Definition
RTDCIMPAMTQSETOT $_{q, p}$	$	*Real-Time DC Import Amount QSE Total per QSE*—The total of the payments to QSE *q* for energy imported into the ERCOT System through DC Ties *p,* for the 15-minute Settlement Interval.
RTDCIMPAMT $_{q, p}$	$	*Real-Time DC Import Amount per QSE per Settlement Point*—The payment to QSE *q* for DC Tie import through DC Tie *p*, for the 15-minute Settlement Interval.
RTEDCIMPAMT $_{q, p}$	$	*Real-Time Emergency DC Import Amount per QSE per Settlement Point*—The payment to QSE *q* for emergency DC Tie import through DC Tie *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A DC Tie Settlement Point.

6.6.3.5 Real-Time Payment for a Block Load Transfer Point

(1) ERCOT shall pay each QSE for the energy delivered to an ERCOT Load through a Block Load Transfer (BLT) Point that is registered for Settlement when that Load is moved from the ERCOT Control Area to a non-ERCOT Control Area. The payment for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{BLTRAMT}_{q, bltp, p} = \mathbf{(-1) * MAX \{RTSPPEW}_{p}\mathbf{, (VEEPBLTP}_{q, bltp}\mathbf{) * CABLT\} * BLTR}_{q, p, bltp}$$

The above variables are defined as follows:

Variable	Unit	Definition
BLTRAMT $_{q, bltp, p}$	$	*Block Load Transfer Resource Amount per QSE per Settlement Point per BLT Point*—The payment to QSE *q* for the BLT Resource that delivers energy to Load Zone *p* through BLT Point *bltp*, for the 15-minute Settlement Interval.
RTSPPEW $_{p}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point Energy-Weighted*—The Real-Time Settlement Point Price at Settlement Point *p*, for the 15-minute Settlement Interval, that is weighted by

		the state estimated Load of the Load Zone of each SCED interval within the 15-minute Settlement Internal.
VEEPBLTP $_{q, bltp}$	$/MWh	*Verified Emergency Energy Price at BLT Point*—The ERCOT verified cost for the energy delivered to an ERCOT Load through BLT Point *bltp*.
CABLT	none	*Cost Adder for Block Load Transfer*—A multiplier of 1.10.
BLTR $_{q, p, bltp}$	MWh	*Block Load Transfer Resource per QSE per Settlement Point per BLT Point*—The energy delivered to an ERCOT Load in Load Zone *p* through BLT Point *bltp* represented by QSE *q*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Load Zone Settlement Point.
bltp	none	A BLT Point.

(2) The total of the payments to each QSE for all energy delivered to ERCOT Loads through BLT Points for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{BLTRAMTQSETOT}_{q} = \sum_{p} \sum_{bltp} \mathbf{BLTRAMT}_{q, bltp, p}$$

The above variables are defined as follows:

Variable	Unit	Definition
BLTRAMTQSETOT $_{q}$	$	*Block Load Transfer Resource Amount QSE Total per QSE*—The total of the payments to QSE *q* for energy delivered into the ERCOT System through BLT Points for the 15-minute Settlement Interval.
BLTRAMT $_{q, bltp , p}$	$	*Block Load Transfer Resource Amount per QSE per Settlement Point per BLT Point*—The payment to QSE *q* for the BLT Resource at BLT Point *bltp*, which delivers energy to Load Zone *p*, for the 15-minute Settlement Interval.
q	none	A QSE.
p	none	A Load Zone Settlement Point.
bltp	none	A BLT Point.

(3) For the purpose of Settlement, ERCOT shall treat the energy associated with the Presidio Exception like energy delivered to an ERCOT Load through a BLT Point that is moved from the ERCOT Control Area to a non-ERCOT Control Area, by allowing for compensation of verified costs associated with the energy. After receipt and verification of the invoiced cost associated with the Presidio Exception, ERCOT shall compensate for the energy associated with the Presidio Exception using the monthly verified cost multiplied by the Cost Adder for Block Load Transfer defined in paragraph (1) above. ERCOT shall uplift the cost to QSEs representing Load using the monthly LRS per QSE as defined in Section 7.5.7, Method for Distributing CRR Auction Revenues. Costs associated with the Presidio Exception must be submitted to ERCOT within 90 days of the last day of the month that the costs were incurred.

[NPRR1030: Replace paragraph (3) above with the following upon system implementation:]

(3) For the purpose of Settlement, ERCOT shall treat the energy associated with the Presidio Exception like energy delivered to an ERCOT Load through a BLT Point that is moved from the ERCOT Control Area to a non-ERCOT Control Area, by allowing for compensation of verified costs associated with the energy. After receipt and verification of the invoiced cost associated with the Presidio Exception, ERCOT shall compensate for the energy associated with the Presidio Exception using the monthly verified cost multiplied by the Cost Adder for Block Load Transfer defined in paragraph (1) above. ERCOT shall uplift the cost to QSEs representing Load using the same methodology as defined in Section 7.5.7, Method for Distributing CRR Auction Revenues. Costs associated with the Presidio Exception must be submitted to ERCOT within 90 days of the last day of the month that the costs were incurred.

(a) The monthly payment to be calculated as follows:

$$\mathbf{MBLTAMT}_{q,p} = \mathbf{(-1) * VMEBLTP}_{q,p} \mathbf{* CABLT}$$

The above variables are defined as follows:

Variable	Unit	Definition
$MBLTAMT_{q,p}$	$	*Monthly Block Load Transfer Amount per QSE per Settlement Point*—The payment to QSE *q* for the delivered energy to Load Zone *p* for the month.
$VMEBLTP_{q,p}$	$/MWh	*Verified Monthly Energy Cost*—The ERCOT verified monthly cost for the energy delivered to an ERCOT Load as determined by an invoice submitted to ERCOT.
CABLT	none	*Cost Adder for Block Load Transfer*—A multiplier of 1.10.
q	none	A QSE.
p	none	A Load Zone Settlement Point.

(b) The total of the payments to each QSE for all energy delivered to ERCOT Loads through BLT Points for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{MBLTAMTQSETOT}_{q} = \sum_{p} \mathbf{MBLTAMT}_{q,p}$$

The above variables are defined as follows:

Variable	Unit	Definition
$MBLTAMTQSETOT_{q}$	$	*Monthly Block Load Transfer Amount QSE Total per QSE*—The total of the payments to QSE *q* for energy delivered into the ERCOT System for the month.
$MBLTAMT_{q,p}$	$	*Monthly Block Load Transfer Amount per QSE per Settlement Point*—The payment to QSE *q* for the delivered energy to Load Zone *p* for the month.
q	none	A QSE.
p	none	A Load Zone Settlement Point.

(c) ERCOT shall calculate each QSE's monthly BLT charge as follows:

$$\mathbf{LAMBLTAMT}_{q} = \mathbf{(-1) * MLRS}_{q} \mathbf{* MBLTAMTTOT}$$

$$\mathbf{MBLTAMTTOT} = \sum_{q} \mathbf{MBLTAMTQSETOT}_{q}$$

The above variables are defined as follows:

Variable	Unit	Description
$MLRS_q$	none	*Monthly Load Ratio Share per QSE*—The LRS calculated for QSE *q* for the peak-Load 15-minute Settlement Interval in the month. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval.
$MBLTAMTQSETOT_q$	$	*Monthly Block Load Transfer Amount QSE Total per QSE*—The total of the payments to QSE *q* for energy delivered into the ERCOT System for the month.
$LAMBLTAMT_q$	$	*Load-Allocated Monthly BLT Amount per QSE*—Monthly BLT charge for QSE *q*.
MBLTAMTTOT	$	*Monthly BLT Amount ERCOT wide Total*—The total monthly BLT charge for all QSEs.
q	none	A QSE.

[NPRR1030: Replace paragraph (c) above with the following upon system implementation:]

(c) ERCOT shall calculate each QSE's monthly BLT charge as follows:

$$\mathbf{LAMBLTAMT}_{q} = \mathbf{(-1) * (MBLTDC}_{q} \mathbf{+ MBLTNDC}_{q}\mathbf{)}$$

Where:

$$MBLTNDC_q = MLRS_q * (MBLTAMTTOT - \sum_{q} MBLTDC_q)$$

$$MBLTDC_q = DCMLRS_q * MBLTAMTTOT$$

$$MBLTAMTTOT = \sum_{q} MBLTAMTQSETOT_q$$

The above variables are defined as follows:

Variable	Unit	Description
$LAMBLTAMT_q$	$	*Load-Allocated Monthly BLT Amount per QSE*—Sum of the monthly BLT charges for Loads and DC Tie exports for QSE *q*.
$DCMLRS_q$	none	*DC Tie Export Monthly Load Ratio Share per QSE*—The ratio share calculated for QSE *q* with DC Tie Exports for the calendar month.
$MLRS_q$	none	*Monthly Load Ratio Share per QSE*—The ratio share of Loads excluding DC Tie Exports for QSE *q*, for the peak Load 15-minute Settlement Interval.
$MBLTAMTQSETOT_q$	$	*Monthly Block Load Transfer Amount QSE Total per QSE*—The total of the payments to QSE *q* for energy delivered into the ERCOT System for the month.
$MBLTDC_q$	$	*Monthly BLT Amount for DC Tie Exports per QSE*—Monthly BLT amount for DC Tie exports for QSE *q*.

MBLTNDC $_q$	$	*Monthly BLT Amount for Non-DC Tie Loads per QSE*—Monthly BLT amount for Loads (excluding DC Tie exports) for QSE *q*.
MBLTAMTTOT	$	*Monthly BLT Amount ERCOT wide Total*—The total monthly BLT payment for all QSEs.
q	none	A QSE.

6.6.3.6 Real-Time High Dispatch Limit Override Energy Payment

(1) If ERCOT directs a reduction in a Generation Resource's real power output by employing a manual High Dispatch Limit (HDL) override 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 received a SCED Base Point equal to the Resource's HDL override, 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; 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; 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 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 was issued for an interval prior to the disputed interval(s).

The payment shall be calculated as follows:

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

Where:

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

$$\text{HDLOBRKP}_{q,r,p,i} = \text{Min}(\text{AVGHASL}_{q,r,p,i}, \text{HDLOBRKPCP}_{q,r,p,i})$$

The above variables are defined as follows:

Variable	Unit	Definition
$\text{HDLOAL}_{q,r,p,i}$	$	*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.
$\text{HDLOEAMT}_{q,r,p,i}$	$	*High Dispatch Limit override energy amount per QSE per Generation Resource*—The payment to QSE *q* for an ERCOT-issued HDL override 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.
$\text{HDLOBRKP}_{q,r,p,i}$	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.
$\text{AVGHDL}_{q,r,p,i}$	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 manual HDL override, 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.
$\text{AVGHASL}_{q,r,p,i}$	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.

Variable	Unit	Definition
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 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*.
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 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.

Variable	Unit	Definition
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 real power output by employing a manual High Dispatch Limit (HDL) override 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 received a SCED Base Point equal to the Resource's HDL override, 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; 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; 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 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 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:

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

Where:

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

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

The above variables are defined as follows:

Variable	Unit	Definition
$\text{HDLOAL}_{q,r,p,i}$	$	*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.
$\text{HDLOEAMT}_{q,r,p,i}$	$	*High Dispatch Limit override energy amount per QSE per Generation Resource*—The payment to QSE *q* for an ERCOT-issued HDL override 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.
$\text{HDLOBRKP}_{q,r,p,i}$	MW	*High Dispatch Limit override break point per QSE per Resource*—The point on the Energy Offer Curve corresponding to the lesser of the 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 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.
$\text{AVGHDL}_{q,r,p,i}$	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 manual HDL override, 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.

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 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.
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 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 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.
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 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.

6.6.3.7 Real-Time High Dispatch Limit Override Energy Charge

(1) ERCOT shall allocate to QSEs on an LRS basis the total amount of the payment specified in Section 6.6.3.6, Real-Time High Dispatch Limit Override Energy Payment. The charge to each QSE for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{LAHDLOEAMT}_{q,i} = \mathbf{(-1) * HDLOEAMTTOT * LRS}_{q,i}$$

Where:

$$\text{HDLOEAMTTOT}_i = \sum_q \text{HDLOEAMTQSETOT}_{q,i}$$

The above variables are defined as follows:

Variable	Unit	Definition
LAHDLOPEAMT $_q$	$	*Load-Allocated High Dispatch Limit override energy amount per QSE*—The charge to QSE *q* for an HDL override, for the 15-minute Settlement Interval.
HDLOEAMTTOT $_i$	$	*High Dispatch Limit energy amount total*—The total of payments to all QSEs for HDL overrides, for the 15-minute Settlement Interval *i*.
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 an HDL override for this QSE for the 15-minute Settlement Interval *i*.
LRS $_{q, i}$	none	*The Load Ratio Share* calculated for QSE *q* for the 15-minute Settlement Interval *i*. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval.
q	none	A QSE.
i	none	A 15-minute Settlement Interval.

6.6.3.8 Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG) or a Settlement Only Transmission Generator (SOTG)

(1) The payment or charge to each QSE for energy from an SODG or an SOTG shall be based on an identified nodal energy price, RTESOGPR, as described in this subsection, with the following exceptions:

(a) An SODG or SOTG that has opted out of nodal pricing as described in paragraph (5) below; or

(b) Any site with one or more ESS SODGs or SOTGs where the ESS capacity constitutes more than 50% of the site's total SOG nameplate capacity.

(2) For an SODG, the price used as the basis for the 15-minute Real-Time price calculation is the time-weighted price at the Electrical Bus associated with this mapped Load in the Network Operations Model. For an SOTG, the price used as the basis for the 15-minute Real-Time price calculation is the time-weighted price at the Electrical Bus as determined by ERCOT in review of the meter location of the SOTG in the Network Operations Model. SODG and SOTG sites will be represented as a single unit in the ERCOT Settlement system.

(3) For an SODG or an SOTG, the total payment or charge for each 15-minute Settlement Interval shall be calculated as follows:

$$\mathbf{MEBSOGNET}_{q,\,gsc} = \mathbf{Max}\left(0, \sum_{b} \mathbf{MEBSOG}_{q,\,gsc,\,b}\right)$$

If $MEBSOGNET_{q,\,gsc} = 0$ for a 15-minute Settlement Interval, then

The Load is included in the Real-Time AML per QSE and is included in the Real-Time energy imbalance payment or charge at a Load Zone.

Otherwise, when $MEBSOGNET_{q,\,gsc} > 0$ for a 15-minute Settlement Interval, then

$$\mathbf{RTESOGSAMT}_{q,\,gsc} = \mathbf{(-1)} * \left[\sum_{b} \left(\mathbf{RTESOGPR}_{b} * \mathbf{MEBSOG}_{q,\,gsc,\,b}\right)\right]$$

Where the price for the SOTG or SODG is determined as follows:

$$\mathbf{RTESOGPR}_{b} = \mathbf{Max}\left[\mathbf{-\$251}, \sum_{y} \left(\left(\mathbf{SDWF}_{y} * \mathbf{RTLMP}_{b,\,y}\right) + \mathbf{RTRSVPOR} + \mathbf{RTRDP}\right)\right]$$

Where:

$$RTRSVPOR = \sum_{y} \left(SDWF_{y} * RTORPA_{y}\right)$$

$$RTRDP = \sum_{y} \left(SDWF_{y} * RTORDPA_{y}\right)$$

$$SDWF_{y} = TLMP_{y} \,/\, \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
RTESOGSAMT $_{q, gsc}$	$	*Real-Time Energy for SODG and SOTG Site Amount* —The total payment or charge to QSE *q* for SODG or SOTG site *gsc* for the 15-minute Settlement Interval.
RTESOGPR $_{b}$	$/MWh	*Real-Time Price for the Energy Metered for each SODG or SOTG Site* —The Real-Time price at Electrical Bus *b* for the Settlement Meter for the SODG or SOTG site for the 15-minute Settlement Interval.
MEBSOGNET $_{q, gsc}$	MWh	*Net Metered energy at gsc for an SODG or SOTG Site* —The net sum for all Settlement Meters for SODG or SOTG site *gsc* represented by QSE *q*. A positive value indicates an injection of power to the ERCOT System.
MEBSOG $_{q, gsc, b}$	MWh	*Metered energy at bus for an SODG or SOTG Site* —The metered energy by the Settlement Meter(s) at Electrical Bus *b* for SODG or SOTG site *gsc* represented by QSE *q*. A positive value represents energy produced, and a negative value represents energy consumed.
RTRSVPOR	$/MWh	*Real-Time Reserve Price for On-Line Reserves*—The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval.
RTORPA $_{y}$	$/MWh	*Real-Time On-Line Reserve Price Adder per interval*—The Real-Time On-Line Reserve Price Adder for the SCED interval *y*.
RTRDP	$/MWh	*Real-Time On-Line Reliability Deployment Price* —The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder.
RTORDPA $_{y}$	$/MWh	*Real-Time On-Line Reliability Deployment Price Adder* —The Real-Time Price Adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
SDWF $_{y}$	None	*SCED Duration Weighting Factor per interval*—The weight used in the SODG or SOTG price calculation for the portion of the SCED interval *y* within the Settlement Interval.
RTLMP $_{b, y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval*—The Real-Time LMP at Electrical Bus *b*, for the SCED interval *y*.
TLMP $_{y}$	second	*Duration of SCED interval per interval*—The duration of the SCED interval *y* within the Settlement Interval.
gsc	none	A generation site code.
b	none	An Electrical Bus.
y	None	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.

(4) The total net payments and charges to each QSE for energy from SODGs and SOTGs for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTESOGAMTQSETOT}_{q} = \sum_{gsc} \mathbf{RTESOGSAMT}_{q, gsc}$$

The above variables are defined as follows:

Variable	Unit	Definition
RTESOGAMTQSETOT $_q$	$	*Real-Time Energy Payment or Charge per QSE for Energy from SODGs and SOTGs* —The payment or charge to QSE *q* for Real-Time energy from SODGs and SOTGs, for the 15-minute Settlement Interval.
RTESOGSAMT $_{q, gsc}$	$	*Real-Time Energy for SODG and SOTG Site Amount* —The total payment or charge to QSE *q* for an SODG or SOTG site *gsc* for the 15-minute Settlement Interval.
q	none	A QSE.
gsc	none	A generation site code.

(5) Notwithstanding anything else in this Section except paragraphs (6) and (7) below, a Resource Entity may opt out of nodal pricing and continue Load Zone Settlement for any SODG or SOTG if, by January 1, 2019, the SODG or SOTG was operational or was subject to a Power Purchase or Tolling Agreement (PPA) or Transmission and/or Distribution Service Provider (TDSP) interconnection agreement, or had an executed agreement with a developer. By December 31, 2019, the Resource Entity must submit a properly completed Section 23, Form N, Pricing Election for Settlement Only Distribution Generators and Settlement Only Transmission Generators. Any SODG or SOTG relying on a PPA or TDSP interconnection agreement or agreement with a developer must also have achieved Initial Synchronization for the full Resource capacity before June 1, 2020 to be eligible to opt out of nodal pricing. A Resource Entity must provide ERCOT documented proof of any PPA, TDSP interconnection agreement, or developer agreement that it relies on as a basis for any election under this paragraph. This election is valid through the earlier of December 31, 2029 or the date on which the election is revoked pursuant to paragraph (8) of this Section. On January 1, 2030, all SODGs and SOTGs will be subject to nodal pricing.

(6) For any SODG or SOTG for which the applicable Resource Entity has elected to opt out of nodal pricing, ERCOT shall settle the output of the SODG or SOTG using the Load Zone Settlement Point Price for the duration of the opt-out period so long as the SODG or SOTG is not physically modified for any purpose, including to increase the capacity of the unit or change the fuel type of the unit, except as necessary for routine maintenance or repairs to address normal wear and tear.

(7) If at any time ERCOT determines that the SODG or SOTG fails to meet the opt-out conditions in paragraph (6) above, ERCOT shall settle the output of the SODG or SOTG at the applicable nodal price as soon as practicable after providing written notice to the affected Resource Entity.

(8) A Resource Entity that has opted out of nodal pricing for one or more SODGs or SOTGs pursuant to paragraph (5) of this Section may withdraw that election and begin receiving applicable nodal pricing for one or more such generators by submitting a properly completed election form (Section 23, Form N). An election of nodal pricing is irrevocable. ERCOT will effectuate the transition of an SODG or SOTG to nodal pricing in ERCOT Settlement systems as soon as practicable.

[NPRR995 and NPRR1010: Replace applicable portions of Section 6.6.3.8 above with the following upon system implementation for NPRR995; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.6.3.8 Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG), Settlement Only Transmission Generator (SOTG), Settlement Only Distribution Energy Storage System (SODESS), or Settlement Only Transmission Energy Storage System (SOTESS)

(1) The payment or charge to each QSE for energy from an SODG, SOTG, SODESS, or SOTESS shall be based on an identified nodal energy price, RTESOPR, as described in this subsection, with the exception of an SODG or SOTG that has opted out of nodal pricing as described in paragraph (7) below.

(2) For an SODG or an SODESS, the price used as the basis for the 15-minute Real-Time price calculation is the time-weighted price at the Electrical Bus associated with this mapped Load in the Network Operations Model. For an SOTG or an SOTESS, the price used as the basis for the 15-minute Real-Time price calculation is the time-weighted price at the Electrical Bus as determined by ERCOT in review of the meter location of the SOTG or SOTESS in the Network Operations Model. Load that is not WSL will be included in the Real-Time AML per QSE. Each SODG, SOTG, SODESS, and SOTESS site will be represented as a single unit in the ERCOT Settlement system.

(3) For an SODG, SOTG, SODESS, or SOTESS, the total payment or charge for each 15-minute Settlement Interval shall be calculated as follows:

$$\mathbf{MEBSOGNET}_{q,\,gsc} = \mathbf{Max}\left(0, \sum_{b} \mathbf{MEBSOG}_{q,\,gsc,\,b}\right)$$

If $MEBSOGNET_{q,\,gsc} = 0$ for a 15-minute Settlement Interval, then

The Load is included in the Real-Time AML per QSE, excluding WSL.

Otherwise, when $MEBSOGNET_{q,\,gsc} > 0$ for a 15-minute Settlement Interval, then

$$\mathbf{RTGSOAMT}_{q,\,gsc} = \mathbf{(-1)} * \left[\sum_{b} \mathbf{(RTESOPR}_{b} * \mathbf{MEBSOG}_{q,\,gsc,\,b})\right]$$

(4) For an SODESS or SOTESS, the total payment or charge for each 15-minute Settlement Interval shall be calculated as follows:

$$\mathbf{RTWSLSOAMT}_{q,\,gsc} = \mathbf{(-1)} * \left[\sum_{b} \mathbf{(RTESOPR}_{b} * \mathbf{WSOL}_{q,\,gsc,\,b})\right]$$

$$\mathbf{RTNWSLSOAMT}_{q,\,gsc} = \mathbf{(-1)} * \left[\sum_{b} \mathbf{(RTESOPR}_{b} * \mathbf{NWSOL}_{q,\,gsc,\,b})\right]$$

(5) The price for the SOTG, SODG, SODESS, or SOTESS is determined as follows:

$$\mathbf{RTESOPR}_{b} = \mathbf{Max\ [-\$251,\ \sum_{y}\ ((SDWF_{y} * RTLMP_{b,y}) + RTRDP)]}$$

Where:

$$RTRDP = \sum_{y} (SDWF_{y} * RTRDPA_{y})$$

$$SDWF_{y} = TLMP_{y} / \sum_{y} TLMP_{y}$$

The above variables are defined as follows:

Variable	Unit	Description
$RTGSOAMT_{q, gsc}$	$	*Real-Time Generation for SODG, SOTG, SODESS, or SOTESS Site Amount* —The total payment or charge for generation to QSE *q* for SODG, SOTG, SODESS, or SOTESS site *gsc* for the 15-minute Settlement Interval.
$RTWSLSOAMT_{q, gsc}$	$	*Real-Time WSL for SODESS or SOTESS Site Amount* —The total payment or charge for WSL to QSE *q* for the SODESS or SOTESS site *gsc* for the 15-minute Settlement Interval.
$RTNWSLSOAMT_{q, gsc}$	$	*Real-Time Non-WSL for SODESS or SOTESS Site Amount* —The total payment or charge for Non-WSL Settlement Only Charging Load to QSE *q* for the SODESS or SOTESS site *gsc* for the 15-minute Settlement Interval.
$RTESOPR_{b}$	$/MWh	*Real-Time Price for the Energy Metered for each SODG, SOTG, SODESS, or SOTESS Site* —The Real-Time price at Electrical Bus *b* for the Settlement Meter for the SODG, SOTG, SODESS, or SOTESS site for the 15-minute Settlement Interval.
$MEBSOGNET_{q, gsc}$	MWh	*Net Metered energy at gsc for an SODG, SOTG, SODESS or SOTESS Site* —The net sum for all Settlement Meters for SODG, SOTG, SODESS, or SOTESS site *gsc* represented by QSE *q*. A positive value indicates an injection of power to the ERCOT System.
$MEBSOG_{q, gsc, b}$	MWh	*Metered energy at bus for an SODG, SOTG, SODESS, or SOTESS Site* —The metered energy by the Settlement Meter(s) at Electrical Bus *b* for SODG, SOTG, SODESS, or SOTESS site *gsc* represented by QSE *q* for the 15-minute Settlement Interval. A positive value represents energy produced, and a negative value represents energy consumed.
$WSOL_{q, gsc, b}$	MWh	*WSL for an SODESS or SOTESS Site*—The WSL as measured for an SODESS or SOTESS site *gsc* at Electrical Bus *b*, represented by QSE *q*, represented as a negative value, for the 15-minute Settlement Interval.
$NWSOL_{q, gsc, b}$	MWh	*Non-WSL Settlement Only Charging Load for an SODESS or SOTESS Site*—The Non-WSL Settlement Only Charging Load as measured for an SODESS or SOTESS site *gsc* at Electrical Bus *b*, represented by QSE *q*, represented as a negative value, for the 15-minute Settlement Interval.

RTRDP	$/MWh	*Real-Time Reliability Deployment Price for Energy* —The Real-Time price for the 15-minute Settlement Interval, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time Reliability Deployment Price Adder for Energy.
$RTRDPA_y$	$/MWh	*Real-Time Reliability Deployment Price Adder for Energy* —The Real-Time price adder that captures the impact of reliability deployments on energy prices for the SCED interval *y*.
$SDWF_y$	None	*SCED Duration Weighting Factor per interval* —The weight used in the SODG, SOTG, SODESS, or SOTESS price calculation for the portion of the SCED interval *y* within the Settlement Interval.
$RTLMP_{b,y}$	$/MWh	*Real-Time Locational Marginal Price at bus per interval* —The Real-Time LMP at Electrical Bus *b*, for the SCED interval *y*.
$TLMP_y$	second	*Duration of SCED interval per interval* —The duration of the SCED interval *y* within the Settlement Interval.
gsc	none	A generation site code.
b	none	An Electrical Bus.
y	None	A SCED interval in the 15-minute Settlement Interval. The summation is over the total number of SCED runs that cover the 15-minute Settlement Interval.

(6) The total net payments and charges to each QSE for energy from SODGs, SOTGs, SODESSs, or SOTESSs for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTESOAMTQSETOT}_q = \sum_{gsc} (\mathbf{RTGSOAMT}_{q,gsc} + \mathbf{RTWSLSOAMT}_{q,gsc} + \mathbf{RTNWSLSOAMT}_{q,gsc})$$

The above variables are defined as follows:

Variable	Unit	Definition
$RTESOAMTQSETOT_q$	$	*Real-Time Energy Payment or Charge per QSE for SODGs, SOTGs, SODESSs, or SOTESSs* —The payment or charge to QSE *q* for Real-Time energy from SODGs, SOTGs, SODESSs, or SOTESSs, for the 15-minute Settlement Interval.
$RTGSOAMT_{q,gsc}$	$	*Real-Time Generation for SODG, SOTG, SODESS, or SOTESS Site Amount* —The total payment or charge for generation to QSE *q* for SODG, SOTG, SODESS, or SOTESS site *gsc* for the 15-minute Settlement Interval.
$RTWSLSOAMT_{q,gsc}$	$	*Real-Time WSL for SODESS or SOTESS Site Amount* —The total payment or charge for WSL to QSE *q* for the SODESS or SOTESS site *gsc* for the 15-minute Settlement Interval.
$RTNWSLSOAMT_{q,gsc}$	$	*Real-Time Non-WSL for SODESS or SOTESS Site Amount* —The total payment or charge for Non-WSL Settlement Only Charging Load to QSE *q* for the SODESS or SOTESS site *gsc* for the 15-minute Settlement Interval.
q	none	A QSE.
gsc	none	A generation site code.

(7) Notwithstanding anything else in this Section except paragraphs (8) and (9) below, a Resource Entity may opt out of nodal pricing and continue Load Zone Settlement for any

SODG or SOTG if, by January 1, 2019, the SODG or SOTG was operational or was subject to a Power Purchase or Tolling Agreement (PPA) or Transmission and/or Distribution Service Provider (TDSP) interconnection agreement, or had an executed agreement with a developer. By December 31, 2019, the Resource Entity must submit a properly completed Section 23, Form N, Pricing Election for Settlement Only Distribution Generators and Settlement Only Transmission Generators. Any SODG or SOTG relying on a PPA or TDSP interconnection agreement or agreement with a developer must also have achieved Initial Synchronization for the full Resource capacity before June 1, 2020 to be eligible to opt out of nodal pricing. A Resource Entity must provide ERCOT documented proof of any PPA, TDSP interconnection agreement, or developer agreement that it relies on as a basis for any election under this paragraph. This election is valid through the earlier of December 31, 2029 or the date on which the election is revoked pursuant to paragraph (10) of this Section. On January 1, 2030, all SODGs and SOTGs will be subject to nodal pricing.

(8) For any SODG or SOTG for which the applicable Resource Entity has elected to opt out of nodal pricing, ERCOT shall settle the output of the SODG or SOTG using the Load Zone Settlement Point Price for the duration of the opt-out period so long as the SODG or SOTG is not physically modified for any purpose, including to increase the capacity of the unit or change the fuel type of the unit, except as necessary for routine maintenance or repairs to address normal wear and tear.

(9) If at any time ERCOT determines that the SODG or SOTG fails to meet the opt-out conditions in paragraph (8) above, ERCOT shall settle the output of the SODG or SOTG at the applicable nodal price as soon as practicable after providing written notice to the affected Resource Entity.

(10) A Resource Entity that has opted out of nodal pricing for one or more SODGs or SOTGs pursuant to paragraph (7) of this Section may withdraw that election and begin receiving applicable nodal pricing for one or more such generators by submitting a properly completed election form (Section 23, Form N). An election of nodal pricing is irrevocable. ERCOT will effectuate the transition of an SODG or SOTG to nodal pricing in ERCOT Settlement systems as soon as practicable.

6.6.4 Real-Time Congestion Payment or Charge for Self-Schedules

(1) The congestion payment or charge to each QSE submitting a Self-Schedule calculated based on the difference in Real-Time Settlement Point Prices at the specified sink and the source of the Self-Schedule multiplied by the amount of the Self-Schedule. The congestion charge to each QSE for each of its Self-Schedule for a given 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTCCAMT}_{q,s} = (\mathbf{RTSPP}_{sink,s} - \mathbf{RTSPP}_{source,s}) * (\mathbf{SSQ}_{q,s} * 1/4)$$

The above variables are defined as follows:

Variable	Unit	Description
RTCCAMT $_{q, s}$	$	*Real-Time Congestion Cost Amount per QSE per Self-Schedule*—The congestion charge to QSE *q* for its Self-Schedule *s*, for the 15-minute Settlement Interval.
RTSPP $_{sink, s}$	$/MWh	*Real-Time Settlement Point Price at the Sink of Self-Schedule*—The Real-Time Settlement Point Price at the sink of the Self-Schedule *s*, for the 15-minute Settlement Interval.
RTSPP $_{source, s}$	$/MWh	*Real-Time Settlement Point Price at the Source of Self-Schedule*—The Real-Time Settlement Point Price at the source of the Self-Schedule *s*, for the 15-minute Settlement Interval.
SSQ $_{q,s}$	MW	*Self-Schedule Quantity per Self-Schedule*—The QSE *q*'s Self Schedule MW quantity for Self-Schedule *s*, for the 15-minute Settlement Interval.
q	none	A QSE.
s	none	A Self-Schedule.
sink	none	Sink Settlement Point
source	none	Source Settlement Point

(2) The total net congestion payments and charges to each QSE for all its Self-Schedules for the 15-minute Settlement Interval is calculated as follows:

$$\mathbf{RTCCAMTQSETOT}_{q} = \sum_{s} \mathbf{RTCCAMT}_{q, s}$$

The above variables are defined as follows:

Variable	Unit	Definition
RTCCAMTQSETOT $_{q}$	$	*Real-Time Congestion Cost Amount QSE Total per QSE*—The total net congestion payments and charges to QSE *q* for its Self-Schedules for the 15-minute Settlement Interval.
RTCCAMT $_{q, s}$	$	*Real-Time Congestion Cost Amount per QSE per Self-Schedule*—The congestion payment or charge to QSE *q* for its Self-Schedule *s*, for the 15-minute Settlement Interval.
q	none	A QSE.
s	none	A Self-Schedule.

6.6.5 Base Point Deviation Charge

[NPRR1029: Replace the title for Section 6.6.5 above with the following upon system implementation:]

6.6.5 Set Point Deviation Charge

6.6.5.1 Resource Base Point Deviation Charge

(1) A QSE for a Generation Resource or Controllable Load Resource shall pay a Base Point Deviation Charge if the Resource did not follow Dispatch Instructions and Ancillary Service deployments within defined tolerances, except when the Dispatch Instructions

and Ancillary Service deployments violate the Resource Parameters. The Base Point Deviation Charge does not apply to Generation Resources when Adjusted Aggregated Base Point (AABP) is less than the Resource's average telemetered LSL, the QSE's Generation Resources are operating in Constant Frequency Control (CFC) mode, or any time during the Settlement Interval when the telemetered Resource Status is set to ONTEST or STARTUP. The Base Point Deviation Charge does not apply to a Controllable Load Resource if the computed Base Point is equal to the snapshot of its telemetered power consumption for all SCED runs during the Settlement Interval or any time during the Settlement Interval when the telemetered Resource Status is set to OUTL. The desired output from a Generation Resource or desired consumption from a Controllable Load Resource during a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{AABP}_{q,r,p,i} = \mathbf{AVGBP}_{q,r,p,i} + \mathbf{AVGREG}_{q,r,p,i}$$

Where:

$$\text{AVGBP}_{q,r,p,i} = \sum_{y} (\text{AVGBP5M}_{q,r,p,i,y}) / 3$$

$$\text{AVGREG}_{q,r,p,i} = \sum_{y} (\text{AVGREG5M}_{q,r,p,i,y}) / 3$$

$$\text{AVGREG5M}_{q,r,p,i,y} = (\text{AVGREGUP5M}_{q,r,p,i,y} - \text{AVGREGDN5M}_{q,r,p,i,y})$$

The above variables are defined as follows:

Variable	Unit	Definition
$\text{AABP}_{q,r,p,i}$	MW	*Adjusted Aggregated Base Point per QSE per Settlement Point per Resource*—The aggregated Base Point adjusted for Ancillary Service deployments of Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, AABP is calculated for the Combined Cycle Train considering all SCED Dispatch Instructions to any Combined Cycle Generation Resources within the Combined Cycle Train.
$\text{AVGBP}_{q,r,p,i}$	MW	*Average Base Point per QSE per Settlement Point per Resource*—The average of the five-minute clock interval Base Points over the 15-minute Settlement Interval *i* for Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*.

Variable	Unit	Definition
AVGBP5M $_{q, r, p, i, y}$	MW	*Average five-minute clock interval Base Point per QSE per Settlement Point per Resource*—The average Base Point for the Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the five-minute clock interval *y* within the 15-minute Settlement Interval *i*. The time-weighted average of the linearly ramped Base Points in a five-minute clock interval *y*. 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 clock interval *y*. 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). The linear ramp is recalculated each time that a new Base Point is received from SCED. AVGBP5M is equal to the ABP value calculated for use in Generation Resource Energy Deployment Performance (GREDP) or the ABP value calculated for use in the Controllable Load Resource Energy Deployment Performance (CLREDP), as described in Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource Energy Deployment Performance.
AVGREG $_{q, r, p, i}$	MW	*Average Regulation Instruction per QSE per Settlement Point per Resource* —The average of the five-minute clock interval *y* Regulation Instruction Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* over the 15-minute Settlement Interval *i*.
AVGREG5M $_{q, r, p, i, y}$	MW	*Total Average five-minute clock interval Regulation Instruction per QSE per Settlement Point per Resource*—The total amount of regulation that the Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* should have produced based on Load Frequency Control (LFC) deployment signals over the five-minute clock interval *y* within the 15-minute Settlement Interval *i*.
AVGREGUP5M $_{q, r, p, i, y}$	MW	*Average Regulation Instruction Up per QSE per Settlement Point per Resource*—The amount of Regulation Up Service (Reg-Up) that the Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* should have produced based on LFC deployment signals over the five-minute clock interval *y* within the 15-minute Settlement Interval *i*.
AVGREGDN5M $_{q, r, p, i, y}$	MW	*Average Regulation Instruction Down per QSE per Settlement Point per Resource*—The amount of Regulation Down Service (Reg-Down) that the Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* should have produced based on LFC deployment signals over the five-minute clock interval *y* within the 15-minute Settlement Interval *i*.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Generation Resource or Controllable Load Resource.
i	None	A 15-minute Settlement Interval
y	none	A five-minute clock interval in the Settlement Interval.

[NPRR963, NPRR1010, and NPRR1014: Replace applicable portions of Section 6.6.5.1 above with the following upon system implementation for NPRR963 or NPRR1014; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.6.5.1 Resource Set Point Deviation Charge

(1) A QSE for a Generation Resource, ESR, or Controllable Load Resource shall pay a Set Point Deviation Charge if the Resource did not follow UDSPs within defined tolerances, except when the UDSPs violate the Resource Parameters.

(2) The desired output from a Generation Resource, ESR, or Controllable Load Resource during a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{AASP}_{q,r,p,i} = \sum_{y} \mathbf{(AVGSP5M}_{q,r,p,i,y}\mathbf{)} / 3$$

The above variables are defined as follows:

Variable	Unit	Definition
$AASP_{q,r,p,i}$	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 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.
$AVGSP5M_{q,r,p,i,y}$	MW	*Average Five Minute Clock Interval Set Point per QSE per Settlement Point per Resource* –The time-weighted average of the Updated Desired Set Point (UDSP) that Resource *r* for QSE *q* at Settlement Point *p* should have produced, for the five-minute clock interval *y* within the 15-minute Settlement Interval *i*. AVGSP5M is equal to the ASP value calculated for use in Generation Resource Energy Deployment Performance (GREDP), Controllable Load Resource Energy Deployment Performance (CLREDP), or Energy Storage Resource Energy Deployment Performance (ESREDP), as described in Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Generation Resource, ESR, or Controllable Load Resource.
i	none	A 15-minute Settlement Interval
y	none	A five-minute clock interval in the Settlement Interval.

6.6.5.1.1 General Generation Resource and Controllable Load Resource Base Point Deviation Charge

(1) Unless one of the exceptions specified in paragraphs (2) and (3) below applies, ERCOT shall charge a Base Point Deviation Charge for a Resource other than those described in Section 6.6.5.2, IRR Generation Resource Base Point Deviation Charge, and Section 6.6.5.3, Resources Exempt from Deviation Charges, when the telemetered generation of the Generation Resource or telemetered power consumption of the Controllable Load Resource over the 15-minute Settlement Interval is outside the tolerances defined later in this Section 6.6.5.1.1.

(2) ERCOT may not charge a QSE a Base Point Deviation Charge under paragraph (1) above when both of the following apply:

(a) The deviation of the Resource over the 15-minute Settlement Interval is in a direction that contributes to frequency corrections that resolve an ERCOT System frequency deviation; and

(b) The ERCOT System frequency deviation is greater than +/-0.05 Hz at any time during the 15-minute Settlement Interval.

(3) ERCOT may not charge a QSE a Base Point Deviation Charge under paragraph (1) above for any 15-minute Settlement Interval during which:

(a) ERCOT Contingency Reserve Service (ECRS) was deployed; or

(b) Responsive Reserve (RRS) was manually deployed by ERCOT.

[NPRR963: Delete Section 6.6.5.1.1 above upon system implementation and renumber accordingly.]

6.6.5.1.1.1 Base Point Deviation Charge for Over Generation

(1) ERCOT shall charge a QSE for a Generation Resource for over-generation that exceeds the following tolerance. The tolerance is the greater of:

(a) 5% of the average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments; or

(b) Five MW for metered generation above the average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments.

(2) The over-generation charge to each QSE for each Generation Resource at each Resource Node Settlement Point is calculated as follows:

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

Where:

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

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

The above variables are defined as follows:

Variable	Unit	Definition
BPDAMT $_{q, r, p, i}$	$	*Base 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 Base Point, for the 15-minute Settlement Interval *i*. The Base 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.
AABP $_{q, r, p, i}$	MW	*Adjusted Aggregated Base Point per QSE per Settlement Point per Resource*—The aggregated Base Point adjusted for Ancillary Service deployments, of Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p,* for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, AABP is calculated for the Combined Cycle Train considering all SCED Dispatch Instructions 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 Base 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.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A non-exempt, non-Intermittent Renewable Resource (IRR).
y	none	A five-minute clock interval in the Settlement Interval.
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:

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

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

(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:

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

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

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

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 Resource.
y	none	A five-minute clock interval in the Settlement Interval.
i	none	A 15-minute Settlement Interval.
wg	none	An IRR Group.

6.6.5.1.1.2 Base Point Deviation Charge for Under Generation

(1) ERCOT shall charge a QSE for a Generation Resource for under generation if the metered generation is below the lesser of:

(a) 95% of the average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments; or

(b) The average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments minus five MW.

(2) The under-generation charge to each QSE for each Generation Resource at each Resource Node Settlement Point for a given 15-minute Settlement Interval is calculated as follows:

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

Where:

$$UGEN_{q,r,p,i} = Max\ [0, [Min\ ((1- K2) * ¼ * AABP_{q,r,p,i},\ ¼ * (AABP_{q,r,p,i} - Q2)) - TWTG_{q,r,p,i}]]$$

$$TWTG_{q,r,p,i} = (\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3) * ¼$$

The above variables are defined as follows:

Variable	Unit	Definition
$BPDAMT_{q,r,p,i}$	$	*Base 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 Base Point, for the 15-minute Settlement Interval *i*. A Base 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.
$AABP_{q,r,p,i}$	MW	*Adjusted Aggregated Base Point*—The aggregated Base Point adjusted for Ancillary Service deployments of Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, AABP is calculated for the Combined Cycle Train considering all SCED Dispatch Instructions 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 Base 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.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A non-exempt, non-IRR.
y	none	A five-minute clock interval in the Settlement Interval.
i	none	A 15-minute Settlement Interval.

[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 ESRs, 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 ESR, 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:

$$UGEN_{q,r,p,i} = Max\ [0, [Min\ ((1- K2) * ¼ * AASP_{q,r,p,i},\ ¼ * (AASP_{q,r,p,i} - Q2)) - TWTG_{q,r,p,i}]]$$

$$TWTG_{q,r,p,i} = (\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3) * ¼$$

(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:

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

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

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

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 Resource.
y	none	A five-minute clock interval in the Settlement Interval.
i	none	A 15-minute Settlement Interval.
wg	none	An IRR Group.

6.6.5.1.1.3 Controllable Load Resource Base Point Deviation Charge for Over Consumption

(1) ERCOT shall charge a QSE for a Controllable Load Resource for over-consumption that exceeds the following tolerance. The tolerance is the greater of:

(a) XO% of the average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments; or

(b) YO MW for power consumption above the average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments.

(2) The Controllable Load Resource Base Point Deviation Charge for over-consumption variables XO and YO shall be subject to review and approval by the Technical Advisory Committee (TAC) and shall be posted to the ERCOT website no later than three Business Days after TAC approval.

(3) The charge to each QSE for non-excused over-consumption for each Controllable Load Resource during a 15-minute Settlement Interval in which the Controllable Load Resource has received a Base Point is calculated as follows:

$$\mathbf{BPDAMT}_{q,r,p,i} = \mathbf{-1 * Min\ (PRZ1, RTSPP}_{p,i}\mathbf{) * Min\ (1, KP1) * OCONSM}_{q,r,p,i}$$

Where:

$$OCONSM_{q,r,p,i} = Max\ [0, (ATPC_{q,r,p,i} - \tfrac{1}{4} * Max\ (((1 + KLR1) * AABP_{q,r,p,i}), (AABP_{q,r,p,i} + QLR1)))]$$

$$ATPC_{q,r,p,i} = (\sum_{y} (AVGTPC5M_{q,r,p,i,y}) / 3) * \tfrac{1}{4}$$

The above variables are defined as follows:

Variable	Unit	Definition

BPDAMT $_{q, r, p, i}$	$	*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 Point *p*, for its deviation from Base Point, for the 15-minute Settlement Interval *i*.
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*.
ATPC $_{q, r, p, i}$	MWh	*Average Telemetered Power Consumption per QSE per Settlement Point per Controllable Load Resource*—The average telemetered power consumption of the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
AABP $_{q, r, p, i}$	MW	*Adjusted Aggregated Base Point per QSE per Settlement Point per Resource*—The aggregated Base Point adjusted for Ancillary Service deployments of Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
AVGTPC5M $_{q, r, p, i, y}$	MW	*Average Telemetered Power Consumption for the 5 Minutes*—The average telemetered power consumption of Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the five-minute clock interval *y*, within the 15-minute Settlement Interval *i*.
OCONSM $_{q, r, p, i}$	MWh	*Over-Consumption Volumes per QSE per Settlement Point per Controllable Load Resource*—The amount over-consumed by the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* for the 15-minute Settlement Interval *i*.
KP1	none	The coefficient applied to the Settlement Point Price for over-consumption charge, 1.0.
PRZ1	$/MWh	The price to use for the charge calculation when RTSPP is greater than -$20, -$20/MWh.
KLR1	none	The percentage tolerance for over-consumption of a Controllable Load Resource, XO%.
QLR1	MW	The MW tolerance for over-consumption of a Controllable Load Resource, YO MW.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Controllable Load Resource.
i	none	A 15-minute Settlement Interval.
y	none	A five-minute clock interval in the Settlement Interval.

[NPRR963, NPRR1010, and NPRR1014: Replace applicable portions of Section 6.6.5.1.1.3 above with the following upon system implementation for NPRR963 or NPRR1014; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; and renumber accordingly:]

6.6.5.3 Controllable Load Resource Set Point Deviation Charge for Over Consumption

(1) ERCOT shall charge a QSE of a Controllable Load Resource, for over-consumption that exceeds the following tolerance. The tolerance is the greater of:

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

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

(2) The Controllable Load Resource Set Point Deviation Charge for over-consumption variables XO and YO shall be subject to review and approval by the Technical Advisory Committee (TAC) and shall be posted to the ERCOT website no later than three Business Days after TAC approval.

(3) The charge to each QSE for non-excused over-consumption for each Controllable Load Resource, during a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{SPDAMT}_{q,r,p,i} = \mathbf{-1 * Min\ (PRZ1, RTSPP}_{p,i}\mathbf{) * Min\ (1, KP1) * OCONSM}_{q,r,p,i}$$

Where:

$$OCONSM_{q,r,p,i} = Max\ [0, (ATPC_{q,r,p,i} - \tfrac{1}{4} * Max\ (((1 + KLR1) * AASP_{q,r,p,i}), (AASP_{q,r,p,i} + QLR1)))]$$

$$ATPC_{q,r,p,i} = (\sum_{y} (AVGTPC5M_{q,r,p,i,y}) / 3) * \tfrac{1}{4}$$

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 Controllable Load Resource *r* at Settlement Point *p*, for its deviation from AASP, for the 15-minute Settlement Interval *i*.
$RTSPP_{p,i}$	$/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*.
$ATPC_{q,r,p,i}$	MWh	*Average Telemetered Power Consumption per QSE per Settlement Point per Controllable Load Resource*—The average telemetered power consumption of the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$AASP_{q,r,p,i}$	MW	*Average Aggregated Set Point for the Resource per QSE per Settlement Point per Resource*—The average of the Average Five Minute Clock Interval Set Point (AVGSP5M) of Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$AVGTPC5M_{q,r,p,i,y}$	MW	*Average Telemetered Power Consumption for the 5 Minutes*—The average telemetered power consumption of Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the five-minute clock interval *y*, within the 15-minute Settlement Interval *i*.
$OCONSM_{q,r,p,i}$	MWh	*Over-Consumption Volumes per QSE per Settlement Point per Controllable Load Resource*—The amount over-consumed by the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* for the 15-minute Settlement Interval *i*.
KP1	none	The coefficient applied to the Settlement Point Price for over-consumption charge, 1.0.
PRZ1	$/MWh	The price to use for the charge calculation when RTSPP is greater than -$20, -$20/MWh.
KLR1	none	The percentage tolerance for over-consumption of a Controllable Load Resource, XO%.

QLR1	MW	The MW tolerance for over-consumption of a Controllable Load Resource, YO MW.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Controllable Load Resource.
i	none	A 15-minute Settlement Interval.
y	none	A five-minute clock interval in the Settlement Interval.

6.6.5.1.1.4 Controllable Load Resource Base Point Deviation Charge for Under Consumption

(1) ERCOT shall charge a QSE for a Controllable Load Resource for under-consumption if the average telemetered power consumption is below than the lesser of:

(a) [100-XU]% of the average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments; or

(b) The average of the Base Points in the Settlement Interval adjusted for any Ancillary Service deployments minus YU MW.

(2) The Controllable Load Resource Base Point Deviation Charge for under-consumption variables XU and YU shall be subject to review and approval by TAC and shall be posted to the ERCOT website no later than three Business Days after TAC approval.

(3) The charge to each QSE for non-excused under-consumption of each Controllable Load Resource during a 15-minute Settlement Interval in which the Controllable Load Resource has received a Base Point is calculated as follows:

$$\mathbf{BPDAMT}_{q,r,p,i} = \mathbf{Max\ (PRZ2, RTSPP}_{p,i}\mathbf{)} * \mathbf{UCONSM}_{q,r,p,i}$$

Where:

$$UCONSM_{q,r,p,i} = Max\ [0, [Min\ ((1 - KLR2) * ¼ * AABP_{q,r,p,i}, ¼ * (AABP_{q,r,p,i} - QLR2)) - ATPC_{q,r,p,i}]]$$

$$ATPC_{q,r,p,i} = (\sum_{y} (AVGTPC5M_{q,r,p,i,y}) / 3) * ¼$$

The above variables are defined as follows:

Variable	Unit	Definition
$BPDAMT_{q,r,p,i}$	$	*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 Point *p*, for its deviation from Base Point, for the 15-minute Settlement Interval *i*.
$RTSPP_{p,i}$	$/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*.

ATPC $_{q, r, p, i}$	MWh	*Average Telemetered Power Consumption per QSE per Settlement Point per Controllable Load Resource*—The average telemetered power consumption of the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
AABP $_{q, r, p, i}$	MW	*Adjusted Aggregated Base Point per QSE per Settlement Point per Resource*—The aggregated Base Point adjusted for Ancillary Service deployments of Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
AVGTPC5M $_{q, r, p, i, y}$	MW	*Average Telemetered Power Consumption for the 5 Minutes*—The average telemetered power consumption of Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the five-minute clock interval *y*, within the 15-minute Settlement Interval *i*.
UCONSM $_{q, r, p, i}$	MWh	*Under Consumption Volumes per QSE per Settlement Point per Controllable Load Resource*—The amount under-consumed by the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* for the 15-minute Settlement Interval *i*.
PRZ2	$/MWh	The price to use for the Base Point Deviation Charge for under-consumption calculation when RTSPP is less than $20/MWh, $20/MWh.
KLR2		The percentage tolerance for under-consumption of a Controllable Load Resource, XU%.
QLR2	MW	The MW tolerance for under-consumption of a Controllable Load Resource, YU MW.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Controllable Load Resource.
i	none	A 15-minute Settlement Interval.
y	none	A five-minute clock interval in the Settlement Interval.

[NPRR963, NPRR1010, and NPRR1014: Replace applicable portions of Section 6.6.5.1.1.4 above with the following upon system implementation for NPRR963 or NPRR1014; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010:]

6.6.5.3.1 Controllable Load Resource Set Point Deviation Charge for Under Consumption

(1) ERCOT shall charge a QSE for a Controllable Load Resource, for under-consumption if the average telemetered power consumption is below than the lesser of:

(a) [100-XU]% of the AASP in the Settlement Interval; or

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

(2) The Controllable Load Resource Set Point Deviation Charge for under-consumption variables XU and YU shall be subject to review and approval by TAC and shall be posted to the ERCOT website no later than three Business Days after TAC approval.

(3) The charge to each QSE for non-excused under-consumption of each Controllable Load Resource, during a 15-minute Settlement Interval is calculated as follows:

$$\mathbf{SPDAMT}_{q,r,p,i} = \mathbf{Max\ (PRZ2, RTSPP}_{p,i}\mathbf{)} * \mathbf{UCONSM}_{q,r,p,i}$$

Where:

$$UCONSM_{q,r,p,i} = Max\ [0, [Min\ ((1 - KLR2) * ¼ * AASP_{q,r,p,i}, ¼ * (AASP_{q,r,p,i} - QLR2)) - ATPC_{q,r,p,i}]]$$

$$ATPC_{q,r,p,i} = (\sum_{y} (AVGTPC5M_{q,r,p,i,y}) / 3) * ¼$$

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 Controllable Load Resource *r* at Settlement Point *p*, for its deviation from AASP, for the 15-minute Settlement Interval *i*.
$RTSPP_{p,i}$	$/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*.
$ATPC_{q,r,p,i}$	MWh	*Average Telemetered Power Consumption per QSE per Settlement Point per Controllable Load Resource*—The average telemetered power consumption of the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$AASP_{q,r,p,i}$	MW	*Average Aggregated Set Point for the Resource per QSE per Settlement Point per Resource*—The average of the Average Five Minute Clock Interval Set Point (AVGSP5M) of Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
$AVGTPC5M_{q,r,p,i,y}$	MW	*Average Telemetered Power Consumption for the 5 Minutes*—The average telemetered power consumption of Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the five-minute clock interval *y*, within the 15-minute Settlement Interval *i*.
$UCONSM_{q,r,p,i}$	MWh	*Under-Consumption Volumes per QSE per Settlement Point per Controllable Load Resource*—The amount under-consumed by the Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p* for the 15-minute Settlement Interval *i*.
PRZ2	$/MWh	The price to use for the Set Point Deviation Charge for under-consumption calculation when RTSPP is less than $20/MWh, $20/MWh.
KLR2		The percentage tolerance for under-consumption of a Controllable Load Resource, XU%.
QLR2	MW	The MW tolerance for under-consumption of a Controllable Load Resource, YU MW.
q	none	A QSE.
p	none	A Settlement Point.
r	none	A Controllable Load Resource.
i	none	A 15-minute Settlement Interval.
y	none	A five-minute clock interval in the Settlement Interval.

6.6.5.2 IRR Generation Resource Base Point Deviation Charge

(1) ERCOT shall charge a QSE for an IRR a Base Point Deviation Charge if the IRR metered generation is more than 10% above its Adjusted Aggregated Base Point and the flag

signifying that the IRR has received a Base Point below the HDL used by SCED has been received.

(2) The charge to each QSE for non-excused over-generation of each IRR that is not included in an IRR Group at each Resource Node Settlement Point during a 15-minute Settlement Interval, is calculated as follows:

If the flag signifying that the IRR has received a Base Point below the HDL used by SCED is not set in all SCED intervals within the 15-minute Settlement Interval:

$$\mathbf{BPDAMT}_{q,r,p,i} = \mathbf{0}$$

Otherwise, if the flag signifying that the IRR has received a Base Point below the HDL used by SCED is set in all SCED intervals within the 15-minute Settlement Interval:

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

Where:

$$OGENIRR_{q,r,p,i} = \text{Max}\ [0, TWTG_{q,r,p,i} - ¼ * AABP_{q,r,p,i} * (1 + KIRR)]$$

$$TWTG_{q,r,p,i} = (\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3) * ¼$$

(3) The charge to each QSE for non-excused over-generation of each IRR that is included in an IRR Group, at each Resource Node Settlement Point, if the Real-Time metered generation is greater than the upper tolerance during a 15-minute Settlement Interval, is calculated as follows:

If the flag signifying that the IRR has received a Base Point below the HDL used by SCED is not set in all SCED intervals within the 15-minute Settlement Interval for any of the IRRs within an IRR Group, then for all IRRs within an IRR Group:

$$\mathbf{BPDAMT}_{q,r,p} = \mathbf{0}$$

If the flag signifying that the IRR has received a Base Point below the HDL used by SCED is set in all SCED intervals within the 15-minute Settlement Interval for any of the IRRs within an IRR Group, then the deviation penalty is determined for the IRR Group and evenly allocated and charged to each IRR within that IRR Group:

$$\mathbf{BPDAMT}_{q,r,p} = \mathbf{[Max\ (PR1, RTSPP}_{p}\mathbf{)} * \mathbf{OGENIRR}_{q,wg,i}\mathbf{] / N}$$

Where:

$$OGENIRR_{q,wg,i} = \text{Max}\ [0, TWTG_{q,wg,i} - ¼ * AABP_{q,wg,i} * (1 + KIRR)]$$

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

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

The above variables are defined as follows:

Variable	Unit	Definition
BPDAMT $_{q, r, p, i}$	$	*Base 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 Base Point, for the 15-minute Settlement Interval *i*.
RTSPP $_{p, i}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point*—The Real-Time Settlement Point Price at Resource Node *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*.
AABP $_{q, r, p, i}$	MW	*Adjusted Aggregated Base Point Generation per QSE per Settlement Point per Resource*—The aggregated Base Point adjusted for Ancillary Service deployments, of Generation Resource or Controllable Load Resource *r* represented by QSE *q* at Settlement Point *p*, for the 15-minute Settlement Interval *i*.
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*.
OGENIRR $_{q, r, p, i}$	MWh	*Over Generation Volumes per QSE per Settlement Point per IRR Generation Resource*—The amount over generated by the IRR *r* represented by QSE *q* at Resource Node *p* for the 15-minute Settlement Interval *i*.
PR1	$/MWh	The price to use for the charge calculation when RTSPP is less than $20/MWh, $20/MWh.
KIRR	none	The percentage tolerance for over-generation of an IRR, 10%.
N	none	The number of IRRs within an IRR Group.
q	none	A QSE.
p	none	A Settlement Point.
r	none	An IRR Generation Resource or an IRR within an IRR Group.
i	none	A 15-minute Settlement Interval.
y	none	A five-minute clock interval in the Settlement Interval.
wg	none	An IRR Group.

[NPRR879, NPRR963, NPRR1010, and NPRR1111: Replace applicable portions of Section 6.6.5.2 above with the following upon system implementation for NPRR879 or NPRR963; upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation of SCR819 for NPRR1111; and renumber accordingly:]

6.6.5.4 IRR Generation Resource Set Point Deviation Charge

(1) ERCOT shall charge a QSE for an IRR a Set Point Deviation Charge if the IRR telemetered generation is more than 5% above its AASP, the flag signifying that the IRR has received a Base Point below the HDL used by SCED has been received or the IRR has been instructed not to exceed its Base Point, and the IRR is not awarded Ancillary Service and is not part of an IRR Group in which at least one IRR is awarded Ancillary Service for at least one SCED interval within the 15-minute Settlement Interval.

(2) For instances in which an IRR is awarded Ancillary Service or is part of an IRR Group in which at least one IRR is awarded Ancillary Service for at least one SCED interval within the

15-minute Settlement Interval, Set Point Deviation Charges will be determined per Section 6.6.5.2, Set Point Deviation Charge for Over Generation, and Section 6.6.5.2.1, Set Point Deviation Charge for Under Generation.

(3) The charge to each QSE for non-excused over-generation of each IRR that is not included in an IRR Group at each Resource Node Settlement Point during a 15-minute Settlement Interval, is calculated as follows:

If the flag signifying that the IRR has received a Base Point below the HDL used by SCED or the IRR has been instructed not to exceed its Base Point is not set in all SCED intervals within the 15-minute Settlement Interval:

$$\mathbf{SPDAMT}_{q,r,p,i} = 0$$

Otherwise, if the flag signifying that the IRR has received a Base Point below the HDL used by SCED or the IRR has been instructed not to exceed its Base Point is set in all SCED intervals within the 15-minute Settlement Interval:

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

Where:

$$OGENIRR_{q,r,p,i} = Max\ [0, TWTG_{q,r,p,i} - ¼ * AASP_{q,r,p,i} * (1 + KIRR)]$$

$$TWTG_{q,r,p,i} = (\sum_{y} (AVGTG5M_{q,r,p,i,y}) / 3) * ¼$$

(4) The charge to each QSE for non-excused over-generation of each IRR that is included in an IRR Group, at each Resource Node Settlement Point, if the telemetered generation is greater than the upper tolerance during a 15-minute Settlement Interval, is calculated as follows:

If the flag signifying that the IRR has received a Base Point below the HDL used by SCED or the IRR has been instructed not to exceed its Base Point is not set in all SCED intervals within the 15-minute Settlement Interval for any of the IRRs within an IRR Group, then for all IRRs within an IRR Group:

$$\mathbf{SPDAMT}_{q,r,p} = 0$$

If the flag signifying that the IRR has received a Base Point below the HDL used by SCED or the IRR has been instructed not to exceed its Base Point is set in all SCED intervals within the 15-minute Settlement Interval for any of the IRRs within an IRR Group, then the deviation penalty is determined for the IRR Group and evenly allocated and charged to each IRR within that IRR Group:

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

Where:

$$OGENIRR_{q, r, i} = Max [0, TWTG_{q, wg, i} - ¼ * AASP_{q, wg, i} * (1 + KIRR)] / N$$

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

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

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*.
$RTSPP_{p, i}$	$/MWh	*Real-Time Settlement Point Price per Settlement Point*—The Real-Time Settlement Point Price at Resource Node *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*.
$AASP_{q, r, p, i}$	MW	*Average Aggregated Set Point Generation 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*.
$AVGTG5M_{q, r, p, i, y}$	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*.
$OGENIRR_{q, r, p, i}$	MWh	*Over Generation Volumes per QSE per Settlement Point per IRR Generation Resource*—The amount over generated by the IRR *r* represented by QSE *q* at Resource Node *p* for the 15-minute Settlement Interval *i*.
PR1	$/MWh	The price to use for the charge calculation when RTSPP is less than $20/MWh, $20/MWh.
KIRR	none	The percentage tolerance for over-generation of an IRR, 5%.
N	none	The number of IRRs within an IRR Group.
q	none	A QSE.
p	none	A Settlement Point.
r	none	An IRR Generation Resource not awarded Ancillary Service or an IRR within an IRR Group where no member of the IRR Group was awarded Ancillary Service.
i	none	A 15-minute Settlement Interval.
y	none	A five-minute clock interval in the Settlement Interval.
wg	none	An IRR Group.

[NPRR963, NPRR1010, NPRR1014, NPRR1029, and NPRR1111: Insert applicable portions of Section 6.6.5.5 below upon system implementation for NPRR963, NPRR1014, and NPRR1029; upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation of SCR819 for NPRR1111; and renumber accordingly:]

6.6.5.5 Energy Storage Resource Set Point Deviation Charge for Over Performance