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| NPRR Number | [995](http://www.ercot.com/mktrules/issues/nprr995) | NPRR Title | RTF-6 Create Definition and Terms for Settlement Only Storage |
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| Date | | September 10, 2020 | |
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| Submitter’s Information | | | |
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| Company | | ERCOT | |
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| Cell Number | |  | |
| Market Segment | | Not applicable | |

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| Comments |

ERCOT submits these comments to Nodal Protocol Revision Request (NPRR) 995 to clarify that Settlement Only Distribution Energy Storage (SODES) and Settlement Only Transmission Energy Storage (SOTES) should be settled at a nodal price for all discharging (injections) and also for charging (withdrawals) when the energy is stored for later injection to the ERCOT System. ERCOT concurs with the sponsor’s intent that Settlement Only Energy Storage (SOES) should never have the opportunity for inappropriate arbitrage, by discharging and charging with Settlement based on a mix of zonal and nodal prices — e.g., nodal/zonal or zonal/nodal. This is consistent with the principle established in NPRR 986, BESTF-2 Energy Storage Resource Energy Offer Curves, Pricing, Dispatch, and Mitigation.

Currently, NPRR995 language implies that SOES should have a zonal pricing option. These comments provide for nodal Settlement for SODES and SOTES charging energy that is later returned to the ERCOT System as generation, and do not provide the option for such Load to be settled with zonal pricing. This is consistent with the principle established in NPRR917, Nodal Pricing for Settlement Only Distribution Generators and Settlement Only Transmission Generators.

These comments also establish the framework for SODES and SOTES to receive Wholesale Storage Load (WSL) treatment, consistent with the intent of subsection (m) of P.U.C. SUBST. R. 25.501, Wholesale Market Design for the Electric Reliability Council of Texas. The WSL language proposed here mirrors the approach proposed by ERCOT for Energy Storage Resources (ESRs) in NPRR1043, Clarification of NPRR986 Language Related to Wholesale Storage Load, which establishes that energy injections and withdrawals will be settled at a nodal price regardless of whether the resource is receiving WSL treatment. This will ensure proper (nodal) pricing for SODES and SOTES in cases where the Resource Entity chooses not to seek WSL treatment, is unable to isolate charging Load via separate metering, or forfeits WSL status due to an inability to meet the requirements established in NPRR1020, Allow Some Integrated Energy Storage Designs to Calculate Internal Loads.

These comments address markets, Settlements, data aggregation, and metering issues related to SOES. ERCOT will address additional issues relating to operations and planning in a subsequent set of comments to NPRR995. The future comments will also insert SOES terminology in applicable places throughout the Protocols.

ERCOT notes that these comments do not apply to Settlement Only Transmission Self Energy Storage (SOTSES), which, based on the language in NPRR995, are Energy Storage Systems (ESSs) that by definition do not export power to the ERCOT System, and therefore do not require special Settlement language. Energy withdrawals by SOTSES will be settled at the Load Zone price and will be ineligible for WSL treatment.

ERCOT also notes that these comments do not address any potential need for credit requirements for SODES or SOTES based on charging (withdrawal) behavior. ERCOT suggests that if such requirements are deemed appropriate that they should be addressed in a separate, future NPRR.

These comments are provided on top of the ERCOT comments of April 9, 2020.

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| Revised Cover Page Language |

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| Nodal Protocol Sections Requiring Revision | 2.1, Definitions  2.2, Acronyms and Abbreviations  6.3.2, Activities for Real-Time Operations  6.5.5.2, Operational Data Requirements  6.6.3.2, Real-Time Energy Imbalance Payment or Charge at a Load Zone  6.6.3.9, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG) or a Settlement Only Transmission Generator (SOTG)  6.6.10, Real-Time Revenue Neutrality Allocation  9.19.1, Default Uplift Invoices  10.2.3, ERCOT-Polled Settlement Meters  10.2.3.1, Entity EPS Responsibilities  10.2.4, Resource Entity Calculation and Telemetry of ESR Auxiliary Load Values  10.2.4.1, Responsibilities for Resource Entity Calculation and Telemetry of ESR Auxiliary Load Values  10.3.2.3, Generation Netting for ERCOT-Polled Settlement Meters  10.9.1, ERCOT-Polled Settlement Meters  11.1.6, ERCOT-Polled Settlement Meter Netting  16.11.4.3.2, Real-Time Liability Estimate |
| Revision Description | This Nodal Protocol Revision Request (NPRR) accomplishes objectives of the Resource Definition Task Force (RTF) undertaken at the direction of the Protocol Revision Subcommittee (PRS).  Specifically, this NPRR:   * Provides a definition for the term Settlement Only Energy Storage (SOES) and further defines them as transmission-connected or distribution-connected; * Relocates the definition for Settlement Only Generator (SOG) from underneath Resource to stand alone as its own unrelated term; and * Incorporates the relevant SOES terms into the Market Information System (MIS) reporting created for SOGs via NPRR917, Nodal Pricing for Settlement Only Distribution Generators (SODGs) and Settlement Only Transmission Generators (SOTGs). |

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| **Market Rules Notes** |

Please note that the baseline definition of “Resource” has been updated to reflect the incorporation of the following NPRR(s) into the Protocols:

* NPRR990, Relocation of Combined Cycle Train to Resource Attribute (incorporated 9/1/20)
* NPRR1016, Clarify Requirements for Distribution Generation Resources (DGRs) and Distribution Energy Storage Resources (DESRs) (incorporated 9/1/20)

Please note that the baseline definition of “Resource Attribute” has been updated to reflect the incorporation of the following NPRR(s) into the Protocols:

* NPRR967, Remove the 10 MW Limit from the Definition of Limited Duration Resource (LDR) (incorporated 3/1/20)
* NPRR973, Add Definitions for Generator Step-Up and Main Power Transformer (incorporated 9/1/20)
* NPRR986, BESTF-2 Energy Storage Resource Energy Offer Curves, Pricing, Dispatch, and Mitigation (incorporated 3/1/20)
* NPRR990, Relocation of Combined Cycle Train to Resource Attribute (incorporated 9/1/20)
* NPRR1000, Elimination of Dynamically Scheduled Resources (incorporated 9/1/20)

Please note that the baseline definition of “Resource Entity” has been updated to reflect the incorporation of the following NPRR(s) into the Protocols:

* NPRR989, BESTF-1 Energy Storage Resource Technical Requirements (incorporated 7/1/20)
* NPRR990, Relocation of Combined Cycle Train to Resource Attribute (incorporated 9/1/20)

Please note the baseline Protocol language in the following section(s) has been updated to reflect the incorporation of the following NPRR(s) into the Protocols:

* NPRR1000, Elimination of Dynamically Scheduled Resources (incorporated 9/1/20)
  + Section 6.3.2
* NPRR1006, Update Real-Time On-Line Reliability Deployment Price Adder Inputs to Match Actual Data (incorporated 7/1/20)
  + Section 6.3.2

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

* NPRR1010, RTC – NP 6: Adjustment Period and Real-Time Operations
  + Section 6.3.2

Please note that the following NPRR(s) also propose revisions to the definition of “Resource”:

* NPRR1029, BESTF-6 DC-Coupled Resources

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| Revised Proposed Protocol Language |

## 2.1 DEFINITIONS

**Non-WSL Settlement Only Charging Load**

The metered or calculated charging Load withdrawn by a Settlement Only Distribution Energy Storage (SODES) or Settlement Only Transmission Energy Storage (SOTES) that is not receiving Wholesale Storage Load (WSL) treatment.

**Resource**

The term is used to refer to an Energy Storage Resource (ESR), a Generation Resource, or a Load Resource. The term “Resource” used by itself in these Protocols does not include a Settlement Only Generator (SOG) or an Emergency Response Service (ERS) Resource.

***Energy Storage Resource (ESR)***

An Energy Storage System (ESS) registered with ERCOT for the purpose of providing energy and/or Ancillary Service to the ERCOT System.

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| ***[NPRR1016: Insert the following definition “Distribution Energy Storage Resource (DESR)” upon system implementation:]***  ***Distribution Energy Storage Resource (DESR)***  An Energy Storage Resource (ESR) connected to the Distribution System that is either:  (1) Greater than ten MW and not registered with the Public Utility Commission of Texas (PUCT) as a self-generator; or  (2) Greater than one MW that chooses to register as a Resource with ERCOT to participate in the ERCOT markets. |

***Generation Resource***

A generator capable of providing energy or Ancillary Service to the ERCOT System and is registered with ERCOT as a Generation Resource.

***Distribution Generation Resource (DGR)***

A Generation Resource connected to the Distribution System that is either:

(1) Greater than ten MW and not registered with the Public Utility Commission of Texas (PUCT) as a self-generator; or

(2) Ten MW or less that chooses to register as a Generation Resource to participate in the ERCOT markets.

DGRs must be registered with ERCOT in accordance with Planning Guide Section 6.8.2, Resource Registration Process, and will be modeled in ERCOT systems in accordance with Section 3.10.7.2, Modeling of Resources and Transmission Loads.

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| ***[NPRR1016: Replace the definition “Distribution Generation Resource (DGR)” above with the following upon system implementation:]***  ***Distribution Generation Resource (DGR)***  A Generation Resource connected to the Distribution System that is either:  (1) Greater than ten MW and not registered with the Public Utility Commission of Texas (PUCT) as a self-generator; or  (2) Greater than one MW that chooses to register as a Generation Resource to participate in the ERCOT markets. |

***Transmission Generation Resource (TGR)***

A Generation Resource connected to the ERCOT transmission system that is either:

(1) Greater than ten MW and not registered with the Public Utility Commission of Texas (PUCT) as a self-generator; or

(2) Ten MW or less that chooses to register as a Generation Resource to participate in the ERCOT markets.

TGRs must be registered with ERCOT in accordance with Planning Guide Section 6.8.2, Resource Registration Process, and will be modeled in ERCOT systems in accordance with Section 3.10.7.2, Modeling of Resources and Transmission Loads.

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| ***[NPRR1016: Replace the definition “Transmission Generation Resource (TGR)” above with the following upon system implementation:]***  ***Transmission Generation Resource (TGR)***  A Generation Resource connected to the ERCOT transmission system that is either:  (1) Greater than ten MW and not registered with the Public Utility Commission of Texas (PUCT) as a self-generator; or  (2) Greater than one MW that chooses to register as a Generation Resource to participate in the ERCOT markets. |

***Load Resource***

A Load capable of providing Ancillary Service to the ERCOT System and/or energy in the form of Demand response and registered with ERCOT as a Load Resource.

***Aggregate Load Resource (ALR)***

A Load Resource that is an aggregation of individual metered sites, each of which has less than ten MW of Demand response capability and all of which are located within a single Load Zone.

***Controllable Load Resource***

A Load Resource capable of controllably reducing or increasing consumption under Dispatch control by ERCOT.

**Resource Attribute**

Specific qualities associated with various Resources (i.e., specific aspects of a Resource or the services the Resource is qualified to provide).

***Aggregate Generation Resource (AGR)***

A Generation Resource that is an aggregation of generators, with the exception of Intermittent Renewable Resources (IRRs) pursuant to paragraph (12) of Section 3.10.7.2, Modeling of Resources and Transmission Loads, each of which is less than 20 MW in output, which share identical operational characteristics and are interconnected at the same Point of Interconnection (POI) and located behind the same Generator Step-Up (GSU) transformer (with a high-side voltage greater than 60 kV).

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| ***[NPRR973: Replace the definition “Aggregate Generation Resource (AGR)” above with the following upon system implementation of PR106:]***  ***Aggregate Generation Resource (AGR)***  A Generation Resource that is an aggregation of generators, with the exception of Intermittent Renewable Resources (IRRs) pursuant to paragraph (12) of Section 3.10.7.2, Modeling of Resources and Transmission Loads, each of which is less than 20 MW in output, which share identical operational characteristics and are interconnected at the same Point of Interconnection (POI) and located behind the same Main Power Transformer (MPT). |

***Black Start Resource***

A Generation Resource under contract with ERCOT to provide Black Start Service (BSS).

***Combined Cycle Train***

The combinations of gas turbines and steam turbines in an electric generation plant that employs more than one thermodynamic cycle. For example, a Combined Cycle Train refers to the combination of gas turbine generators (operating on the Brayton Cycle) with turbine exhaust waste heat boilers and steam turbine generators (operating on the Rankine Cycle) for the production of electric power. In the ERCOT market, Combined Cycle Trains are each registered as a plant that can operate as a Generation Resource in one or more Combined Cycle Generation Resource configurations.

***Decommissioned Generation Resource***

A Generation Resource for which a Resource Entity has submitted a Notification of Suspension of Operations or a Notification of Change of Generation Resource Designation, for which ERCOT has declined to execute a Reliability Must-Run (RMR) Agreement, and which has been decommissioned and permanently retired.

***Dynamically Scheduled Resource (DSR)***

A Resource that has been designated by the Qualified Scheduling Entity (QSE), and approved by ERCOT, as a DSR status-type and that follows a DSR Load.

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| ***[NPRR1000: Delete the definition “Dynamically Scheduled Resource (DSR)” above upon system implementation.]*** |

***Intermittent Renewable Resource (IRR)***

A Generation Resource that can only produce energy from variable, uncontrollable Resources, such as wind, solar, or run-of-the-river hydroelectricity.

***Intermittent Renewable Resource (IRR) Group***

A group of two or more IRRs whose performance in responding to Security-Constrained Economic Dispatch (SCED) Dispatch Instructions will be assessed as an aggregate for Generation Resource Energy Deployment Performance (GREDP) and Base Point Deviation. An IRR Group cannot contain any IRRs that are Split Generation Resources. Additionally, only IRRs that have the same Resource Node can be mapped to an IRR Group. Resource Entities can choose to group IRRs and shall provide the grouping information in a timely manner for ERCOT review prior to the scheduled database loads.

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| ***[NPRR1016: Insert the following definition “Inverter-Based Resource (IBR)” upon system implementation:]***  ***Inverter-Based Resource (IBR)***  A Resource that is connected to the ERCOT System either completely or partially through a power electronic converter interface. |

***Limited* *Duration* *Resource* (*LDR*)**

An Energy Storage Resource (ESR) that may be unavailable to Security-Constrained Economic Dispatch (SCED) due to the need to maintain its current state of charge.

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| ***[NPRR986: Delete the definition “Limited Duration Resource (LDR)” above upon system implementation.]*** |

***Mothballed Generation Resource***

A Generation Resource for which a Resource Entity has submitted a Notification of Suspension of Operations, for which ERCOT has declined to execute a Reliability Must-Run (RMR) Agreement, and which has not been decommissioned and retired.

***Quick Start Generation Resource (QSGR)***

A Generation Resource that in its cold-temperature state can come On-Line within ten minutes of receiving ERCOT notice and has passed an ERCOT QSGR test that establishes an amount of capacity that can be deployed within a ten-minute period.

***Split Generation Resource***

Where a Generation Resource has been split to function as two or more independent Generation Resources in accordance with Section 10.3.2.1, Generation Resource Meter Splitting, and Section 3.10.7.2, Modeling of Resources and Transmission Loads, each such functionality independent Generation Resource is a Split Generation Resource.

***Switchable Generation Resource (SWGR)***

A Generation Resource that can be connected to either the ERCOT Transmission Grid or a non-ERCOT Control Area.

Resource Entity

An Entity that owns or controls a Generation Resource, a Settlement Only Generator (SOG), a Settlement Only Energy Storage (SOES), or a Load Resource and is registered with ERCOT as a Resource Entity.

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| ***[NPRR989: Replace the above definition “Resource Entity” with the following upon system implementation:]***  **Resource Entity**  An Entity that owns or controls a Generation Resource, an Energy Storage Resource (ESR), a Settlement Only Generator (SOG), a Settlement Only Energy Storage (SOES), or a Load Resource and is registered with ERCOT as a Resource Entity. |

Resource Registration

Provision of information to register Generation Resources, Settlement Only Generators (SOGs), Settlement Only Energy Storage (SOES), and Load Resources.

***Settlement Only Energy Storage (SOES)***

An Energy Storage System (ESS) that is settled for imported/exported energy only, but may not participate in the Ancillary Services market, Reliability Unit Commitment (RUC), Security-Constrained Economic Dispatch (SCED), or submit energy offers or bids. These units are comprised of:

***Settlement Only Distribution Energy Storage (SODES)***

An Energy Storage System (ESS) connected to the Distribution System with a rating of:

(1) One MW or less that chooses to register as an SODES; or

(2) Greater than one and up to ten MW that is capable of providing a net export to the ERCOT System and does not register as a Distribution Energy Storage Resource (DESR).

***Settlement Only Transmission Energy Storage (SOTES)***

An Energy Storage System (ESS) connected to the ERCOT transmission system with a rating of ten MW or less that has not been registered as an Energy Storage Resource (ESR) or as Settlement-Only Transmission Self-Energy Storage (SOTSES).

***Settlement Only Transmission Self-Energy Storage (SOTSES)***

An Energy Storage System (ESS) connected to the ERCOT transmission system with a rating of one MW or more that does not export energy to the ERCOT System.

***Settlement Only Generator (SOG)***

A generator that is settled for exported energy only, but may not participate in the Ancillary Services market, Reliability Unit Commitment (RUC), Security-Constrained Economic Dispatch (SCED), or submit energy offers. These units are comprised of:

***Settlement Only Distribution Generator (SODG)***

A generator that is connected to the Distribution System with a rating of:

(1) One MW or less that chooses to register as an SODG; or

(2) Greater than one and up to ten MW that is capable of providing a net export to the ERCOT System and does not register as a Distribution Generation Resource (DGR).

SODGs must be registered with ERCOT in accordance with Planning Guide Section 6.8.2, Resource Registration Process, and will be modeled in ERCOT systems for reliability in accordance with Section 3.10.7.2, Modeling of Resources and Transmission Loads.

***Settlement Only Transmission Generator (SOTG)***

A generator that is connected to the ERCOT transmission system with a rating of ten MW or less and is registered with the Public Utility Commission of Texas (PUCT) as a power generation company.

SOTGs must be registered with ERCOT in accordance with Planning Guide Section 6.8.2, Resource Registration Process, and may be modeled in ERCOT systems for reliability in accordance with Section 3.10.7.2, Modeling of Resources and Transmission Loads.

***Settlement Only Transmission Self-Generator (SOTSG)***

A generator that is connected to the ERCOT transmission system with a rating of one MW or more and is registered with the Public Utility Commission of Texas (PUCT) as a self-generator.

SOTSGs must be registered with ERCOT in accordance with Planning Guide Section 6.8.2, Resource Registration Process, and will be modeled in ERCOT systems for reliability in accordance with Section 3.10.7.3, Modeling of Private Use Networks.

## 2.2 ACRONYMS AND ABBREVIATIONS

**SODES** Settlement Only Distribution Energy Storage

**SOES** Settlement Only Energy Storage

**SOTES** Settlement Only Transmission Energy Storage

**SOTSES** Settlement Only Transmission Self-Energy Storage

***6.3.2 Activities for Real-Time Operations***

(1) Activities for Real-Time operations begin at the end of the Adjustment Period and conclude at the close of the Operating Hour.

(2) The following table summarizes the timeline for the Operating Period and the activities of QSEs and ERCOT during Real-Time operations where “T” represents any instant within the Operating Hour. The table is intended to be only a general guide and not controlling language, and any conflict between this table and another section of the Protocols is controlled by the other section:

| **Operating Period** | **QSE Activities** | **ERCOT Activities** |
| --- | --- | --- |
| During the first hour of the Operating Period |  | Execute the Hour-Ahead Sequence, including HRUC, beginning with the second hour of the Operating Period  Review the list of Off-Line Available Resources with a start-up time of one hour or less  Review and communicate HRUC commitments and Direct Current Tie (DC Tie) Schedule curtailments  Snapshot the Scheduled Power Consumption for Controllable Load Resources |
| Before the start of each SCED run | Update Output Schedules for DSRs | Validate Output Schedules for DSRs  Execute Real-Time Sequence |
| |  | | --- | | ***[NPRR1000: Delete the row above upon system implementation.]*** | | | |
| SCED run |  | Execute SCED and pricing run to determine impact of reliability deployments on energy prices |
| During the Operating Hour | Telemeter the Ancillary Service Resource Responsibility for each Resource  Acknowledge receipt of Dispatch Instructions  Comply with Dispatch Instruction    Review Resource Status to assure current state of the Resources is properly telemetered  Update COP with actual Resource Status and limits and Ancillary Service Schedules  Communicate Resource Forced Outages to ERCOT  Communicate to ERCOT Resource changes to Ancillary Service Resource Responsibility via telemetry in the time window beginning 30 seconds prior to the five-minute clock interval and ending ten seconds prior to that five-minute clock interval | Communicate all binding Base Points, Dispatch Instructions, and the sum of each type of available reserves, including total Real-Time reserve amount for On-Line reserves, total Real-Time reserve amount for Off-Line reserves, Real-Time Reserve Price Adders for On-Line Reserves, and Real-Time Reserve Price Adders for Off-Line Reserves and LMPs for energy and Ancillary Services, and for the pricing run as described in Section 6.5.7.3.1, Determination of Real-Time On-Line Reliability Deployment Price Adder, the total Reliability Unit Commitment (RUC)/Reliability Must-Run (RMR) MW relaxed, total Load Resource MW deployed that is added to the Demand, total Emergency Response Service (ERS) MW deployed that is added to the Demand, total emergency DC Tie MW that is added to or subtracted from the Demand, total Block Load Transfer (BLT) MW that is added to or subtracted from the Demand, total Low Ancillary Service Limit (LASL), total High Ancillary Service Limit (HASL), Real-Time On-Line Reliability Deployment Price Adder using Inter-Control Center Communications Protocol (ICCP) or Verbal Dispatch Instructions (VDIs)   |  | | --- | | ***[NPRR904 and NPRR1006: Replace applicable portions of the paragraph above with the following upon system implementation:]***  Communicate all binding Base Points, Dispatch Instructions, and the sum of each type of available reserves, including total Real-Time reserve amount for On-Line reserves, total Real-Time reserve amount for Off-Line reserves, Real-Time Reserve Price Adders for On-Line Reserves, and Real-Time Reserve Price Adders for Off-Line Reserves and LMPs for energy and Ancillary Services, and for the pricing run as described in Section 6.5.7.3.1, Determination of Real-Time On-Line Reliability Deployment Price Adder, the total Reliability Unit Commitment (RUC)/Reliability Must-Run (RMR) MW relaxed, total Load Resource MW deployed that is added to the Demand, total Transmission and/or Distribution Service Provider (TDSP) standard offer Load management MW deployed that is added to the Demand, total Emergency Response Service (ERS) MW deployed that is added to the Demand, total ERCOT-directed DC Tie MW that is added to or subtracted from the Demand, total Block Load Transfer (BLT) MW that is added to or subtracted from the Demand, total Low Ancillary Service Limit (LASL), total High Ancillary Service Limit (HASL), Real-Time On-Line Reliability Deployment Price Adder using Inter-Control Center Communications Protocol (ICCP) or Verbal Dispatch Instructions (VDIs) |   Monitor Resource Status and identify discrepancies between COP and telemetered Resource Status  Restart Real-Time Sequence on major change of Resource or Transmission Element Status  Monitor ERCOT total system capacity providing Ancillary Services  Validate COP information  Monitor ERCOT control performance  Distribute by ICCP, and post on the MIS Public Area, System Lambda and the LMPs for each Resource Node, Load Zone and Hub, and the sum of each type of available reserves, including total Real-Time reserve amount for On-Line reserves, total Real-Time reserve amount for Off-Line reserves, Real-Time Reserve Price Adders for On-Line Reserves and Real-Time Reserve Price Adders for Off-Line Reserves, and for the pricing run as described in Section 6.5.7.3.1 the total RUC/RMR MW relaxed, total Load Resource MW deployed that is added to the Demand, total ERS MW deployed that is added to the Demand, total emergency DC Tie MW that is added to or subtracted from the Demand, total BLT MW that is added to or subtracted from the Demand, total On-Line LASL, total On-Line HASL, Real-Time On-Line Reliability Deployment Price Adder created for each SCED process. These prices shall be posted immediately subsequent to deployment of Base Points from SCED with the time stamp the prices are effective   |  | | --- | | ***[NPRR904 and NPRR1006: Replace applicable portions of the paragraph above with the following upon system implementation:]***  Distribute by ICCP, and post on the MIS Public Area, System Lambda and the LMPs for each Resource Node, Load Zone and Hub, and the sum of each type of available reserves, including total Real-Time reserve amount for On-Line reserves, total Real-Time reserve amount for Off-Line reserves, Real-Time Reserve Price Adders for On-Line Reserves and Real-Time Reserve Price Adders for Off-Line Reserves, and for the pricing run as described in Section 6.5.7.3.1 the total RUC/RMR MW relaxed, total Load Resource MW deployed that is added to the Demand, total ERS MW deployed that is added to the Demand, total TDSP standard offer Load management MW deployed that is added to the Demand, total ERCOT-directed DC Tie MW that is added to or subtracted from the Demand, total BLT MW that is added to or subtracted from the Demand, total On-Line LASL, total On-Line HASL, Real-Time On-Line Reliability Deployment Price Adder created for each SCED process. These prices shall be posted immediately subsequent to deployment of Base Points from SCED with the time stamp the prices are effective |  |  | | --- | | ***[NPRR917: Insert the paragraph below upon system implementation:]***  Post on the MIS Public Area the nodal prices for Settlement Only Distribution Generators (SODGs), Settlement Only Distribution Energy Storage (SODES), Settlement Only Transmission Generator (SOTGs), and Settlement Only Transmission Energy Storage (SOTES). These prices shall include all Real-Time Reserve Price Adders for On-Line Reserves and Real-Time On-Line Reliability Deployment Price Adders created for each SCED process. These prices shall be posted immediately subsequent to deployment of Base Points from SCED with the time stamp the prices are effective |   Post LMPs for each Electrical Bus on the MIS Public Area. These prices shall be posted immediately subsequent to deployment of Base Points from each binding SCED with the time stamp the prices are effective   |  | | --- | | ***[NPRR829: Insert paragraph below upon system implementation:]***  Post every 15 minutes on the MIS Public Area the aggregate net injection from Settlement Only Generators (SOGs) that provide Real-Time telemetry to ERCOT, consistent with paragraph (12) of Section 6.5.5.2, Operational Data Requirements. This data shall not be displayed if less than five QSEs or less than 750 megawatts of net injection utilize the option to telemeter Real-Time output for use in the calculation of Real-Time Liability (RTL) as described in Section 16.11.4.3.2, Real-Time Liability Estimate. |   Post on the MIS Public Area the projected non-binding LMPs created by each SCED process for each Resource Node, the projected total Real-Time reserve amount for On-Line reserves and Off-Line reserves, the projected Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders, and for the projected non-binding pricing runs as described in Section 6.5.7.3.1 the total RUC/RMR MW relaxed, total Load Resource MW deployed that is added to Demand, total emergency DC Tie MW that is added to or subtracted from the Demand, total BLT MW that is added to or subtracted from the Demand, total ERS MW deployed that are deployed that is added to the Demand, total LASL, total HASL, Real-Time On-Line Reliability Deployment Price Adder and the projected Hub LMPs and Load Zone LMPs. These projected prices shall be posted at a frequency of every five minutes from SCED for at least 15 minutes in the future with the time stamp of the SCED process that produced the projections   |  | | --- | | ***[NPRR904 and NPRR1006: Replace applicable portions of the paragraph above with the following upon system implementation:]***  Post on the MIS Public Area the projected non-binding LMPs created by each SCED process for each Resource Node, the projected total Real-Time reserve amount for On-Line reserves and Off-Line reserves, the projected Real-Time On-Line Reserve Price Adders and Real-Time Off-Line Reserve Price Adders, and for the projected non-binding pricing runs as described in Section 6.5.7.3.1 the total RUC/RMR MW relaxed, total Load Resource MW deployed that is added to Demand, total TDSP standard offer Load management MW deployed that is added to the Demand, total ERCOT-directed DC Tie MW that is added to or subtracted from the Demand, total BLT MW that is added to or subtracted from the Demand, total ERS MW deployed that are deployed that is added to the Demand, total LASL, total HASL, Real-Time On-Line Reliability Deployment Price Adder and the projected Hub LMPs and Load Zone LMPs. These projected prices shall be posted at a frequency of every five minutes from SCED for at least 15 minutes in the future with the time stamp of the SCED process that produced the projections |   Post on the MIS Certified Area the projected non-binding Base Points for each Resource created by each SCED process. These projected non-binding Base Points shall be posted at a frequency of every five minutes from SCED for at least 15 minutes in the future with the time stamp of the SCED process that produced the projections  Post each hour on the MIS Public Area binding SCED Shadow Prices and active binding transmission constraints by Transmission Element name (contingency /overloaded element pairs)  Post the Settlement Point Prices for each Settlement Point immediately following the end of each Settlement Interval   |  | | --- | | ***[NPRR917: Replace the paragraph above with the following upon system implementation:]***  Post on the MIS Public Area the Settlement Point Prices for each Settlement Point and the Real-Time price for each SODG, SODES, SOTG, and SOTES immediately following the end of each Settlement Interval |   Post the Real-Time On-Line Reliability Deployment Price, Real-Time Reserve Price for On-Line Reserves and the Real-Time Reserve Price for Off-Line Reserves immediately following the end of each Settlement Interval  Post parameters as required by Section 6.4.9, Ancillary Services Capacity During the Adjustment Period and in Real-Time, on the MIS Public Area |

(3) At the beginning of each hour, ERCOT shall post on the MIS Public Area the following information:

(a) Changes in ERCOT System conditions that could affect the security and dynamic transmission limits of the ERCOT System, including:

(i) Changes or expected changes, in the status of Transmission Facilities as recorded in the Outage Scheduler for the remaining hours of the current Operating Day and all hours of the next Operating Day; and

(ii) Any conditions such as adverse weather conditions as determined from the ERCOT-designated weather service;

(b) Updated system-wide Mid-Term Load Forecasts (MTLFs) for all forecast models available to ERCOT Operations, as well as an indicator for which forecast was in use by ERCOT at the time of publication;

(c) The quantities of RMR Services deployed by ERCOT for each previous hour of the current Operating Day; and

(d) Total ERCOT System Demand, from Real-Time operations, integrated over each Settlement Interval.

(4) No later than 0600, ERCOT shall post on the MIS Public Area the actual system Load by Weather Zone, the actual system Load by Forecast Zone, and the actual system Load by Study Area for each hour of the previous Operating Day.

(5) ERCOT shall provide notification to the market and post on the MIS Public Area Electrical Bus Load distribution factors and other information necessary to forecast Electrical Bus Loads. This report will be published when updates to the Load distribution factors are made. Private Use Network net Load will be redacted from this posting.

**6.5.5.2 Operational Data Requirements**

(1) ERCOT shall use Operating Period data to monitor and control the reliability of the ERCOT Transmission Grid and shall use it in network analysis software to predict the short-term reliability of the ERCOT Transmission Grid. Each TSP, at its own expense, may obtain that Operating Period data from ERCOT or directly from QSEs.

(2) A QSE representing a Generation Resource connected to Transmission Facilities or distribution facilities shall provide the following Real-Time telemetry data to ERCOT for each Generation Resource. ERCOT shall make that data available, in accordance with ERCOT Protocols, NERC Reliability Standards, and Governmental Authority requirements, to requesting TSPs and DSPs operating within ERCOT. Such data must be provided to the requesting TSP or DSP at the requesting TSP’s or DSP’s expense, including:

(a) Net real power (in MW) as measured by installed power metering or as calculated in accordance with the Operating Guides based on metered gross real power and conversion constants determined by the Resource Entity and provided to ERCOT through the Resource Registration process. Net real power represents the actual generation of a Resource for all real power dispatch purposes, including use in Security-Constrained Economic Dispatch (SCED), determination of the High Ancillary Service Limit (HASL), High Dispatch Limit (HDL), Low Dispatch Limit (LDL) and Low Ancillary Service Limit (LASL), and is consistent with telemetered HSL, LSL and Non-Frequency Responsive Capacity (NFRC);

(b) Gross real power (in MW) as measured by installed power metering or as calculated in accordance with the Operating Guides based on metered real power, which may include Supervisory Control and Data Acquisition (SCADA) metering, and conversions constants determined by the Resource Entity and provided to ERCOT through the Resource Registration process;

(c) Gross Reactive Power (in Megavolt-Amperes reactive (MVAr));

(d) Net Reactive Power (in MVAr);

(e) Power to standby transformers serving plant auxiliary Load;

(f) Status of switching devices in the plant switchyard not monitored by the TSP or DSP affecting flows on the ERCOT Transmission Grid;

(g) Any data mutually agreed to by ERCOT and the QSE to adequately manage system reliability;

(h) Generation Resource breaker and switch status;

(i) HSL (Combined Cycle Generation Resources) shall:

(i) Submit the HSL of the current operating configuration; and

(ii) When providing RRS, update the HSL as needed, to be consistent with Resource performance limitations of RRS provision;

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| ***[NPRR863: Replace item (ii) above with the following upon system implementation:]***  (ii) When providing ECRS, update the HSL as needed, to be consistent with Resource performance limitations of ECRS provision; |

(j) NFRC currently available (unloaded) and included in the HSL of the Combined Cycle Generation Resource’s current configuration;

(k) High Emergency Limit (HEL), under Section 6.5.9.2, Failure of the SCED Process;

(l) Low Emergency Limit (LEL), under Section 6.5.9.2;

(m) LSL;

(n) Configuration identification for Combined Cycle Generation Resources;

(o) Ancillary Service Schedule for each quantity of RRS and Non-Spin which is equal to the Ancillary Service Resource Responsibility minus the amount of Ancillary Service deployment;

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| ***[NPRR863: Replace item (o) above with the following upon system implementation:]***  (o) Ancillary Service Schedule for each quantity of ECRS and Non-Spin which is equal to the Ancillary Service Resource Responsibility minus the amount of Ancillary Service deployment; |

(i) For On-line Non-Spin, Ancillary Service Schedule shall be set to zero;

(ii) For Off-Line Non-Spin and for On-Line Non-Spin using Off-Line power augmentation technology the Ancillary Service Schedule shall equal the Non-Spin obligation and then shall be set to zero within 20 minutes following Non-Spin deployment;

(p) Ancillary Service Resource Responsibility for each quantity of Regulation Up Service (Reg-Up), Regulation Down Service (Reg-Down), RRS and Non-Spin. The sum of Ancillary Service Resource Responsibility for all Resources in a QSE is equal to the Ancillary Service Supply Responsibility for that QSE;

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| ***[NPRR863: Replace paragraph (p) above with the following upon system implementation:]***  (p) Ancillary Service Resource Responsibility for each quantity of Regulation Up Service (Reg-Up), Regulation Down Service (Reg-Down), RRS, ECRS, and Non-Spin. The sum of Ancillary Service Resource Responsibility for all Resources in a QSE is equal to the Ancillary Service Supply Responsibility for that QSE; |

(q) Reg-Up and Reg-Down participation factors represent how a QSE is planning to deploy the Ancillary Service energy on a percentage basis to specific qualified Resource(s). The Reg-Up and Reg-Down participation factors for a Resource providing Fast Responding Regulation Up Service (FRRS-Up) or Fast Responding Regulation Down Service (FRRS-Down) shall be zero; and

(r) The designated Master QSE of a Generation Resource that has been split to function as two or more Split Generation Resources shall provide Real-Time telemetry for items (a), (b), (c), (d), (e), (g), and (h) above, PSS and AVR status for the total Generation Resource in addition to the Split Generation Resource the Master QSE represents.

(3) For each Intermittent Renewable Resource (IRR), the QSE shall set the HSL equal to the current net output capability of the facility. The net output capability should consider the net real power of the IRR generation equipment, IRR generation equipment availability, weather conditions, and whether the IRR net output is being affected by compliance with a SCED Dispatch Instruction.

(4) For each Aggregate Generation Resource (AGR), the QSE shall telemeter the number of its generators online.

(5) A QSE representing a Load Resource connected to Transmission Facilities or distribution facilities shall provide the following Real-Time data to ERCOT for each Load Resource and ERCOT shall make the data available, in accordance with ERCOT Protocols, NERC standards and policies, and Governmental Authority requirements, to the Load Resource’s host TSP or DSP at the TSP’s or DSP’s expense. The Load Resource’s net real power consumption, Low Power Consumption (LPC) and Maximum Power Consumption (MPC) shall be telemetered to ERCOT using a positive (+) sign convention:

(a) Load Resource net real power consumption (in MW);

(b) Any data mutually agreed to by ERCOT and the QSE to adequately manage system reliability;

(c) Load Resource breaker status;

(d) LPC (in MW);

(e) MPC (in MW);

(f) Ancillary Service Schedule (in MW) for each quantity of RRS and Non-Spin, which is equal to the Ancillary Service Resource Responsibility minus the amount of Ancillary Service deployment;

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| ***[NPRR863: Replace item (f) above with the following upon system implementation:]***  (f) Ancillary Service Schedule (in MW) for each quantity of RRS, ECRS, and Non-Spin, which is equal to the Ancillary Service Resource Responsibility minus the amount of Ancillary Service deployment; |

(g) Ancillary Service Resource Responsibility (in MW) for each quantity of Reg-Up and Reg-Down for Controllable Load Resources, and RRS and Non-Spin for all Load Resources;

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| ***[NPRR863: Replace item (g) above with the following upon system implementation:]***  (g) Ancillary Service Resource Responsibility (in MW) for each quantity of Reg-Up and Reg-Down for Controllable Load Resources, and RRS, ECRS, and Non-Spin for all Load Resources; |

(h) The status of the high-set under-frequency relay, if required for qualification;

(i) For a Controllable Load Resource providing Non-Spin, the Scheduled Power Consumption that represents zero Ancillary Service deployments;

(j) For a single-site Controllable Load Resource with registered maximum Demand response capacity of ten MW or greater, net Reactive Power (in MVAr);

(k) Resource Status (Resource Status shall be ONRL if high-set under-frequency relay is active);

(l) Reg-Up and Reg-Down participation factor, which represents how a QSE is planning to deploy the Ancillary Service energy on a percentage basis to specific qualified Resource(s). The Reg-Up and Reg-Down participation factors for a Resource providing FRRS-Up or FRRS-Down shall be zero; and

(m) For a Controllable Load Resource providing Non-Spin, the “Scheduled Power Consumption Plus Two Hours,” representing the QSE’s forecast of the Controllable Load Resource’s instantaneous power consumption for a point two hours in the future.

(6) A QSE with Resources used in SCED shall provide communications equipment to receive ERCOT-telemetered control deployments.

(7) A QSE providing any Regulation Service shall provide telemetry indicating the appropriate status of Resources providing Reg-Up or Reg-Down, including status indicating whether the Resource is temporarily blocked from receiving Reg-Up and/or Reg-Down deployments from the QSE. This temporary blocking will be indicated by the enabling of the Raise Block Status and/or Lower Block Status telemetry points.

(a) Raise Block Status and Lower Block Status are telemetry points used in transient unit conditions to communicate to ERCOT that a Resource’s ability to adjust its output has been unexpectedly impaired.

(b) When one or both of the telemetry points are enabled for a Resource, ERCOT will cease using the regulation capacity assigned to that Resource for Ancillary Service deployment.

(c) This hiatus of deployment will not excuse the Resource’s obligation to provide the Ancillary Services for which it has been committed.

(d) These telemetry points shall only be utilized during unforeseen transient unit conditions such as plant equipment failures. Raise Block Status and Lower Block Status shall only be enabled until the Resource operator has time to update the Resource limits and Ancillary Service telemetry to reflect the problem.

(e) The Resource limits and Ancillary Service telemetry shall be updated as soon as practicable.  Raise Block Status and Lower Block Status will then be disabled.

(8) Real-Time data for reliability purposes must be accurate to within three percent. This telemetry may be provided from relaying accuracy instrumentation transformers.

(9) Each QSE shall report the current configuration of combined-cycle Resources that it represents to ERCOT. The telemetered Resource Status for a Combined Cycle Generation Resource may only be assigned a Resource Status of OFFNS if no generation units within that Combined Cycle Generation Resource are On-Line.

(10) A QSE representing Combined Cycle Generation Resources shall provide ERCOT with the possible operating configurations for each power block with accompanying limits. Combined Cycle Train power augmentation methods may be included as part of one or more of the registered Combined Cycle Generation Resource configurations. Power augmentation methods may include:

(a) Combustion turbine inlet air cooling methods;

(b) Duct firing;

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

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

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

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

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

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

(c) State of Charge, in MWh;

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

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

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

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| ***[NPRR829: Insert paragraph (14) below upon system implementation:]***  (14) A QSE representing a Settlement Only Generator (SOG) that elects to include the net generation of the SOG in the estimate of Real-Time Liability (RTL) shall provide ERCOT Real-Time telemetry of the net generation of the SOG. |

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| ***[NPRR885: Insert paragraph (15) below upon system implementation:]***  (15) A QSE representing a Must-Run Alternative (MRA) shall telemeter the MRA MW currently available (unloaded) and not included in the HSL. |

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

**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; plus

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| ***[NPRR986: Replace item (g) above with the following upon system implementation:]***  (g) Its AML at the Settlement Point excluding ESR Load that is not WSL and Non-WSL Settlement Only Charging Load; plus |

(h) The aggregated generation of its Settlement Only Generators (SOGs) in the Load Zone.

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| ***[NPRR917: Replace item (h) above with the following upon system implementation:]***  (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 6.6.3.9, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG), Settlement Only Transmission Generator (SOTG), Settlement Only Distribution Energy Storage (SODES), or Settlement Only Transmission Energy Storage (SOTES). 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:

**RTEIAMT *q, p* = (-1) \* {[RTSPP *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)]] + [RTSPPEW *p* \* (RTMGNM *q, p* – RTAML *q, p*)]}**

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| ***[NPRR917 and NPRR986: Replace applicable portions of the formula “RTEIAMT q, p” above with the following upon system implementation:]***  **RTEIAMT *q, p* = (-1) \* {[RTSPP *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)]] + [RTSPPEW *p* \* (RTMGSOGZ *q, p* – (RTAML *q, p* – RTAMLESRNW *q, p* – RTAMLNWSOL *q, p*))]}** |

And

**LZIMBAL *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) – RTAML *q, p* + RTMGNM *q, p***

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| ***[NPRR917 and NPRR986: Replace applicable portions of the formula “LZIMBAL q, p” above with the following upon system implementation:]***  **LZIMBAL *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) – (RTAML *q, p* –RTAMLESRNW *q, p* – RTAMLNWSOL *q, p*) + 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. |
| |  |  |  |  | | --- | --- | --- | --- | | ***[NPRR986: Insert the variable “RTAMLESRNW q, p” below upon system implementation:]***   |  |  |  | | --- | --- | --- | | 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 ESR Load that is not WSL at the Electrical Buses that are included in Settlement Point *p* represented by QSE *q* for the 15-minute Settlement Interval, represented as a positive value. | | | | |
| 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 SODES or SOTES 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. |
| RTMGNM *q, p* | MWh | *Real-Time Metered Generation from Settlement Only Generators per QSE per Settlement Point*—The total Real-Time energy produced by SOGs represented by QSE *q* in Load Zone Settlement Point *p*, for the 15-minute Settlement Interval. |
| |  |  |  |  | | --- | --- | --- | --- | | ***[NPRR917: Replace the variable “RTMGNM q, p” above with the following upon system implementation:]***   |  |  |  | | --- | --- | --- | | 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 SODGs and SOTGs that have opted out of nodal pricing pursuant to Section 6.6.3.9 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:

**RTEIAMTQSETOT *q* = RTEIAMT *q, p***

The above variables are defined as follows:

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| --- | --- | --- |
| **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. |

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| ***[NPRR917: Insert Section 6.6.3.9 below upon system implementation:]***  **6.6.3.9 Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG), Settlement Only Transmission Generator (SOTG), Settlement Only Distribution Energy Storage (SODES), or Settlement Only Transmission Energy Storage (SOTES)**  (1) Except for a SODG or SOTG that has opted out of nodal pricing as described in paragraph (5) below, the payment or charge to each QSE for energy from an SODG, SOTG, SODES, or SOTES shall be based on an identified nodal energy price, RTESOPR, as described in this subsection.  (2) For an SODG or an SODES, 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 SOTES, 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 SOTES in the Network Operations Model. The outflow of energy into the grid as measured by each Settlement Meter for the 15-minute Settlement Interval for an SODG, SOTG, SODES, or SOTES site shall be priced at the nodal energy price. Wholesale Storage Load (WSL) and Non-WSL Settlement Only Charging Load for an SODES or SOTES site shall be settled at the nodal energy price. Load that is not WSL will be included in the Real-Time AML per QSE. Each SODG, SOTG, SODES, and SOTES site will be represented as a single unit in the ERCOT Settlement system.  (3) For an SODG, SOTG, SODES, or SOTES, the total payment or charge for each 15-minute Settlement Interval shall be calculated as follows:  **RTGSOAMT *q,* *gsc* = (-1) \* [( RTESOPR *b* \* OFSOG *q, gsc, b*)]**  **RTWSLSOAMT *q, gsc* = (-1) \* [( RTESOPR *b* \* WSOL *q, gsc, b*)]**  **RTNWSLSOAMT *q, gsc*= (-1) \* [( RTESOPR *b* \* NWSOL *q, gsc, b*)]**  **Where the price for the SOTG, SODG, SODES, or SOTES is determined as follows:**  **RTESOPR *b* = Max [-$251, ( (SDWF *y* \* RTLMP *b, y*) + RTRSVPOR + RTRDP)]**  Where:  RTRSVPOR = (SDWF *y* \* RTORPA *y*)  RTRDP = (SDWF *y* \* RTORDPA *y*)  SDWF *y* = TLMP *y* / TLMP *y*  The above variables are defined as follows:   | **Variable** | **Unit** | **Description** | | --- | --- | --- | | RTGSOAMT*q,**gsc* | $ | *Real-Time Generation for SODG, SOTG, SODES, or SOTES Site Amount* —The total payment or charge for generation to QSE *q* for SODG, SOTG, SODES, or SOTES site *gsc* for the 15-minute Settlement Interval. | | RTWSLSOAMT*q,**gsc* | $ | *Real-Time WSL for SODES or SOTES Site Amount* —The total payment or charge for WSL to QSE *q* for the SODES or SOTES site *gsc* for the 15-minute Settlement Interval. | | RTNWSLSOAMT*q,**gsc* | $ | *Real-Time Non-WSL for SODES or SOTES Site Amount* —The total payment or charge for Non-WSL Settlement Only Charging Load to QSE *q* for the SODES or SOTES site *gsc* for the 15-minute Settlement Interval. | | RTESOPR *b* | $/MWh | *Real-Time Price for the Energy Metered for each SODG, SOTG, SODES, or SOTES Site* ⎯The Real-Time price at Electrical Bus *b* for the Settlement Meter for the SODG, SOTG, SODES*,* or SOTES site for the 15-minute Settlement Interval. | | OFSOG *q,* *gsc, b* | MWh | *Outflow as Measured for an SODG, SOTG, SODES, or SOTES* *Site* ⎯The outflow as measured by the Settlement Meter(s) at Electrical Bus *b* for SODG, SOTG, SODES*,* orSOTES site *gsc* represented by QSE *q* for the 15-minute Settlement Interval. | | WSOL *q, gsc, b* | MWh | *WSL for an SODES or SOTES Site -* The WSL as measured for an SODES or SOTES 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 SODES or SOTES Site -* The Non-WSL Settlement Only Charging Load as measured for an SODES or SOTES site *gsc* at Electrical Bus *b*, represented by QSE *q,* represented as a negative value, for the 15-minute Settlement Interval. | | 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, SOTG, SODES, or SOTES 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, SOTGs, SODES, or SOTES for the 15-minute Settlement Interval is calculated as follows:  **RTESOAMTQSETOT *q* = (RTGSOAMT *q, gsc* +RTWSLSOAMT *q, gsc*+ 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, SODES, or SOTES* —The payment or charge to QSE *q* for Real-Time energy from SODGs, SOTGs, SODESs, or SOTESs for the 15-minute Settlement Interval. | | RTGSOAMT *q, gsc* | $ | *Real-Time Generation for SODG, SOTG, SODES, or SOTES Site Amount* —The total payment or charge for generation to QSE *q* for SODG, SOTG, SODES, or SOTES site *gsc* for the 15-minute Settlement Interval. | | RTWSLSOAMT*q,**gsc* | $ | *Real-Time WSL for SODES or SOTES Site Amount* —The total payment or charge for WSL to QSE *q* for the SODES or SOTES site *gsc* for the 15-minute Settlement Interval. | | RTNWSLSOAMT*q,**gsc* | $ | *Real-Time Non-WSL for SODES or SOTES Site Amount* —The total payment or charge for Non-WSL Settlement Only Charging Load to QSE *q* for the SODES or SOTES 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. |

***6.6.10 Real-Time Revenue Neutrality Allocation***

(1) ERCOT must be revenue-neutral in each Settlement Interval. Each QSE receives an allocated share, on a LRS basis, of the net amount of:

(a) Real-Time Energy Imbalance payments or charges under Section 6.6.3.1, Real-Time Energy Imbalance Payment or Charge at a Resource Node;

(b) Real-Time Energy Imbalance payments or charges under Section 6.6.3.2, Real-Time Energy Imbalance Payment or Charge at a Load Zone;

(c) Real-Time Energy Imbalance payments or charges under Section 6.6.3.3, Real-Time Energy Imbalance Payment or Charge at a Hub;

(d) Real-Time energy payments under Section 6.6.3.4, Real-Time Energy Payment for DC Tie Import;

(e) Real-Time energy payments under Section 6.6.3.5, Real-Time Payment for a Block Load Transfer Point;

(f) Real-Time energy charge under Section 6.6.3.6, Real-Time Energy Charge for DC Tie Export Represented by the QSE Under the Oklaunion Exemption;

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| --- |
| ***[NPRR917: Insert item (g) below upon system implementation and renumber accordingly:]***  (g) Real-Time Energy payments or charges under Section 6.6.3.9, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG), Settlement Only Transmission Generator (SOTG), Settlement Only Distribution Energy Storage (SODES), or Settlement Only Transmission Energy Storage (SOTES); |

(g) Real-Time congestion payments or charges under Section 6.6.4, Real-Time Congestion Payment or Charge for Self-Schedules; and

(h) Real-Time payments or charges to the Congestion Revenue Right (CRR) Owners under Section 7.9.2, Real-Time CRR Payments and Charges.

(2) The Real-Time Revenue Neutrality Allocation for each QSE for a given 15-minute Settlement Interval is calculated as follows:

**LARTRNAMT *q* = (-1) \* (RTEIAMTTOT + BLTRAMTTOT + RTDCIMPAMTTOT + RTDCEXPAMTTOT + RTCCAMTTOT + RTOBLAMTTOT / 4 + RTOBLLOAMTTOT / 4) \* LRS *q***

|  |
| --- |
| ***[NPRR917: Replace the formula “LARTRNAMT q” above with the following upon system implementation:]***  **LARTRNAMT *q* = (-1) \* (RTEIAMTTOT + BLTRAMTTOT + RTDCIMPAMTTOT + RTDCEXPAMTTOT + RTESOGAMTTOT + RTCCAMTTOT + RTOBLAMTTOT / 4 + RTOBLLOAMTTOT / 4) \* LRS *q*** |

Where:

Total Real-Time Energy Imbalance Payment (or Charge) at Settlement Point (or Hub)

RTEIAMTTOT = RTEIAMTQSETOT *q*

Total Real-Time Payment for BLT Resources

BLTRAMTTOT = BLTRAMTQSETOT *q*

Total Real-Time Payment for DC Tie Imports

RTDCIMPAMTTOT = RTDCIMPAMTQSETOT *q*

Total Real-Time Charge for DC Tie Exports (under “Oklaunion Exemption”)

RTDCEXPAMTTOT = RTDCEXPAMTQSETOT *q*

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

RTCCAMTTOT = RTCCAMTQSETOT *q*

Total Real-Time Payment or Charge for Point-to-Point (PTP) Obligations

RTOBLAMTTOT = RTOBLAMTQSETOT *q*

Total Real-Time Payment for PTP Obligations with Links to Options

RTOBLLOAMTTOT = RTOBLLOAMTQSETOT *q*

|  |
| --- |
| ***[NPRR917: Insert the language below upon system implementation:]***  Total Real-Time Payment or Charge for energy from SODGs and SOTGs  RTESOGAMTTOT =  RTESOGAMTQSETOT *q* |

The above variables are defined as follows:

| **Variable** | **Unit** | **Description** |
| --- | --- | --- |
| LARTRNAMT *q* | $ | *Load-Allocated Real-Time Revenue Neutrality Amount per QSE*—The QSE *q*’s share of the total Real-Time revenue neutrality amount, for the 15-minute Settlement Interval. |
| RTEIAMTTOT *q* | $ | *Real-Time Energy Imbalance Amount Total*—The total net payments and charges for Real-Time Energy Imbalance Service at all Settlement Points (Resource, Load Zone or Hub) for the 15-minute Interval. |
| BLTRAMTTOT | $ | *Block Load Transfer Resource Amount Total*⎯The total of payments for energy delivered into the ERCOT Region through BLT points for the 15-minute Settlement Interval. |
| RTDCIMPAMTTOT | $ | *Real-Time DC Import Amount Total*—The summation of payments for DC Tie imports for the 15-minute Settlement Interval. |
| RTDCEXPAMTTOT | $ | *Real-Time DC Export Amount Total*—The summation of charges to all QSEs under the “Oklaunion Exemption” for DC Tie exports for the 15-minute Settlement Interval. |
| RTCCAMTTOT | $ | *Real-Time Energy Congestion Cost Amount Total*—The total net congestion payments and charges for all Self-Schedules for the 15-minute Settlement Interval. |
| RTOBLAMTTOT | $ | *Real-Time Obligation Amount Total*—The sum of all payments and charges for PTP Obligations settled in Real-Time for the hour that includes the 15-minute Settlement Interval. |
| RTOBLLOAMTTOT | $ | *Real-Time Obligation with Links to an Option Amount Total*—The sum of all payments for PTP Obligations with Links to an Option settled in Real-Time for the hour that includes the 15-minute Settlement Interval. |
| 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 Resource Node Settlement Points for the 15-minute Settlement Interval. |
| 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. |
| 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 Region through BLT points for the 15-minute Settlement Interval. |
| RTDCIMPAMTQSETOT *q* | $ | *Real-Time DC Import Amount QSE Total per QSE*⎯The total of the payments to QSE *q* for energy imported into the ERCOT Region through DC Ties for the 15-minute Settlement Interval. |
| RTDCEXPAMTQSETOT *q* | $ | *Real-Time DC Export Amount QSE Total per QSE*⎯The total of the charges to QSE *q* for energy exported from the ERCOT Region through DC Ties for the 15-minute Settlement Interval. |
| RTOBLAMTQSETOT q | $ | *Real-Time Obligation Amount QSE Total per QSE*—The net total payment or charge to QSE *q* of all its PTP Obligations settled in Real-Time for the hour that includes the 15-minute Settlement Interval. See paragraph (2) of Section 7.9.2.1, Payments and Charges for PTP Obligations Settled in Real-Time. |
| RTOBLLOAMTQSETOT *q* | $ | *Real-Time Obligation with Links to an Option Amount QSE Total per QSE*—The total payment to QSE *q* for all of its PTP Obligations with Links to an Option settled in Real-Time for the hour that includes the 15-minute Settlement Interval. See paragraph (2) of Section 7.9.2.1. |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | ***[NPRR917: Insert the variables “RTESOGAMTQSETOT q” and “RTESOGAMTTOT” below upon system implementation:]***   |  |  |  | | --- | --- | --- | | 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. | | RTESOGAMTTOT | $ | *Real-Time Energy Amount Total for Energy from all SODGs and SOTGs* —The total net payments and charges to all QSEs for Real-Time energy from SODGs and SOTGs, for the 15-minute Settlement Interval. | | | | |
| LRS *q* | none | The LRS calculated for QSE *q* for the 15-minute Settlement Interval. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval. |
| *q* | none | A QSE. |
| *o* | none | A CRR owner. |

(3) In the event that ERCOT is unable to execute the DAM, the Real-Time Revenue Neutrality Allocation for each QSE for a given 15-minute Settlement Interval is calculated as follows:

**LARTRNAMT *q* = (-1) \* (RTEIAMTTOT + BLTRAMTTOT + RTDCIMPAMTTOT + RTDCEXPAMTTOT + RTCCAMTTOT + NDRTOBLAMTTOT / 4 + NDRTOPTAMTTOT / 4 + NDRTOPTRAMTTOT / 4 + NDRTOBLRAMTTOT / 4) \* LRS *q***

|  |
| --- |
| ***[NPRR917: Replace the formula “LARTRNAMT q” above with the following upon system implementation:]***  **LARTRNAMT *q* = (-1) \* (RTEIAMTTOT + BLTRAMTTOT + RTDCIMPAMTTOT + RTDCEXPAMTTOT + RTESOAMTTOT + RTCCAMTTOT + NDRTOBLAMTTOT / 4 + NDRTOPTAMTTOT / 4 + NDRTOPTRAMTTOT / 4 + NDRTOBLRAMTTOT / 4) \* LRS *q*** |

Where:

Total Real-Time Energy Imbalance Payment (or Charge) at Settlement Point (or Hub)

RTEIAMTTOT = RTEIAMTQSETOT *q*

Total Real-Time Payment for BLT Resources

BLTRAMTTOT = BLTRAMTQSETOT *q*

Total Real-Time Payment for DC Tie Imports

RTDCIMPAMTTOT = RTDCIMPAMTQSETOT *q*

Total Real-Time Charge for DC Tie Exports (under “Oklaunion Exemption”)

RTDCEXPAMTTOT = RTDCEXPAMTQSETOT *q*

Total Real-Time Congestion Payment or Charge for Self Schedules

RTCCAMTTOT = RTCCAMTQSETOT *q*

Total Real-Time Payment or Charge for PTP Obligations when ERCOT is unable to execute the DAM

NDRTOBLAMTTOT =  NDRTOBLAMTOTOT *o*

Total Real-Time Payment for PTP Options when ERCOT is unable to execute the DAM

NDRTOPTAMTTOT =  NDRTOPTAMTOTOT *o*

Total Real-Time Payment for PTP Options with Refund when ERCOT is unable to execute the DAM

NDRTOPTRAMTTOT = NDRTOPTRAMTOTOT *o*

Total Real-Time Payment or Charge for PTP Obligations with Refund when ERCOT is unable to execute the DAM

NDRTOBLRAMTTOT =  NDRTOBLRAMTOTOT *o*

|  |
| --- |
| ***[NPRR917: Insert the language below upon system implementation:]***  Total Real-Time Payment or Charge for energy from SODGs, SOTGs, SODESs, or SOTESs  RTESOAMTTOT = RTESOAMTQSETOT *q* |

The above variables are defined as follows:

| **Variable** | **Unit** | **Description** |
| --- | --- | --- |
| LARTRNAMT *q* | $ | *Load-Allocated Real-Time Revenue Neutrality Amount per QSE*—The QSE *q*’s share of the total Real-Time revenue neutrality amount for the 15-minute Settlement Interval. |
| RTEIAMTTOT | $ | *Real-Time Energy Imbalance Amount Total*—The total net payments and charges for Real-Time Energy Imbalance at all Settlement Points (Resource, Load Zone, or Hub) for the 15-minute Interval. |
| BLTRAMTTOT | $ | *Block Load Transfer Resource Amount Total*⎯The total of the payments for energy delivered into the ERCOT Region through BLT points for the 15-minute Settlement Interval. |
| RTDCIMPAMTTOT | $ | *Real-Time DC Import Amount Total*—The summation of payments for DC Tie imports for the 15-minute Settlement Interval. |
| RTDCEXPAMTTOT | $ | *Real-Time DC Export Amount Total*—The summation of charges to all QSEs that are under the “Oklaunion Exemption” for DC Tie exports for the 15-minute Settlement Interval. |
| RTCCAMTTOT | $ | *Real-Time Energy Congestion Cost Amount Total*—The total net congestion payments and charges for all Self-Schedules for the 15-minute Settlement Interval. |
| NDRTOBLAMTTOT | $ | *No DAM Real-Time Obligation Amount Total*—The sum of all payments and charges for PTP Obligations settled in Real-Time, when ERCOT is unable to execute the DAM, for the hour that includes the 15-minute Settlement Interval. |
| NDRTOPTAMTTOT | $ | *No DAM Real-Time Option Amount Total*—The sum of all payments for PTP Options settled in Real-Time, when ERCOT is unable to execute the DAM, for the hour that includes the 15-minute Settlement Interval. |
| NDRTOPTRAMTTOT | $ | *No DAM Real-Time Option with Refund Amount Total*—The sum of all payments for PTP Options with Refund settled in Real-Time, when ERCOT is unable to execute the DAM, for the hour that includes the 15-minute Settlement Interval. |
| NDRTOBLRAMTTOT | $ | *No DAM Real-Time Obligation with Refund Amount Total*— The sum of all payments for PTP Obligations with Refund settled in Real-Time, when ERCOT is unable to execute the DAM, for the hour that includes the 15-minute Settlement Interval. |
| 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. |
| 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. |
| 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 Region through BLT points for the 15-minute Settlement Interval. |
| RTDCIMPAMTQSETOT *q* | $ | *Real-Time DC Import Amount QSE Total per QSE*⎯The total of the payments to QSE *q* for energy imported into the ERCOT Region through DC Ties for the 15-minute Settlement Interval. |
| RTDCEXPAMTQSETOT *q* | $ | *Real-Time DC Export Amount QSE Total per QSE*⎯The total of the charges to QSE *q* for energy exported from the ERCOT Region through DC Ties for the 15-minute Settlement Interval. |
| NDRTOBLAMTOTOT *o* | $ | *No DAM Real-Time Obligation Amount Owner Total per CRR Owner*—The net total payment or charge to CRR owner *o* of all its PTP Obligations settled in Real-Time when ERCOT is unable to execute the DAM, for the hour. |
| NDRTOPTAMTOTOT *o* | $ | *No DAM Real-Time Option Amount Owner Total per CRR Owner*—The total payment to CRR owner *o* for all its PTP Options settled in Real-Time when ERCOT is unable to execute the DAM, for the hour. |
| NDRTOPTRAMTOTOT *o* | $ | *No DAM Real-Time Option with Refund Amount Owner Total per CRR Owner*—The total payment to NOIE CRR owner *o* for all its PTP Options with Refund settled in Real-Time when ERCOT is unable to execute the DAM, for the hour. |
| NDRTOBLRAMTOTOT *o* | $ | *No DAM Real-Time Obligation with Refund Amount Owner Total per CRR Owner*—The net total payment or charge to CRR owner *o* for all its PTP Obligations with Refund settled in Real-Time, when ERCOT is unable to execute the DAM, for the hour. |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | [NPRR917: Insert the variables “RTESOAMTQSETOT q” and “RTESOAMTTOT” below upon system implementation:]   |  |  |  | | --- | --- | --- | | RTESOAMTQSETOT *q* | $ | *Real-Time Energy Payment or Charge per QSE for SODGs, SOTGs, SODES, or SOTES* —The payment or charge to QSE *q* for Real-Time energy from SODGs, SOTGs, SODESs, or SOTESs for the 15-minute Settlement Interval. | | RTESOAMTTOT | $ | *Real-Time Energy Amount Total from all SODGs, SOTGs, SODESs, or SOTESs* —The total net payments and charges to all QSEs for Real-Time energy from SODGs, SOTGs, SODESs, or SOTESs for the 15-minute Settlement Interval. | | | | |
| LRS *q* | none | The LRS calculated for QSE *q* for the 15-minute Settlement Interval. See Section 6.6.2.2, QSE Load Ratio Share for a 15-Minute Settlement Interval. |
| *q* | none | A QSE. |
| *o* | none | A CRR Owner. |

***9.19.1 Default Uplift Invoices***

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

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

**DURSCP*cp* = TSPA \* MMARS*cp***

Where:

MMARS *cp* = MMA *cp* / MMATOT

MMA *cp* = Max { ∑*mp* (URTMG *mp*+ URTDCIMP *mp*),

∑*mp* (URTAML *mp* + UWSLTOT *mp*),

∑*mp*URTQQES *mp*,

∑*mp* URTQQEP *mp*,

∑*mp* UDAES *mp*,

∑*mp* UDAEP *mp*,

∑*mp* (URTOBL *mp +* URTOBLLO *mp*),

∑*mp* (UDAOPT *mp*+ UDAOBL *mp*+UOPTS *mp*+UOBLS *mp*),

∑*mp* (UOPTP *mp*+ UOBLP *mp*)}

|  |
| --- |
| ***[NPRR917: Replace the formula “MMA cp” above with the following upon system implementation:]***  MMA *cp* = Max { ∑*mp* (URTMG *mp*+ URTDCIMP *mp* + USOGTOT *mp*),  ∑*mp* (URTAML *mp* + UWSLTOT *mp* + USOCLTOT *mp* ),  ∑*mp*URTQQES *mp*,  ∑*mp* URTQQEP *mp*,  ∑*mp* UDAES *mp*,  ∑*mp* UDAEP *mp*,  ∑*mp* (URTOBL *mp +* URTOBLLO *mp*),  ∑*mp* (UDAOPT *mp*+ UDAOBL *mp*+UOPTS *mp*+UOBLS *mp*),  ∑*mp* (UOPTP *mp*+ UOBLP *mp*)} |

MMATOT = ∑*cp* (MMA*cp*)

Where:

URTMG *mp* = ∑*p, r, i* (RTMG *mp, p, r, i*), excluding RTMG for RMR Resources and RTMG in Reliability Unit Commitment (RUC)-Committed Intervals for RUC-committed Resources

URTDCIMP *mp* = ∑*p, i* (RTDCIMP *mp, p, i*) / 4

URTAML *mp* = max(0,∑*p, i* (RTAML *mp, p, i*))

URTQQES *mp* = ∑*p, i* (RTQQES *mp, p, i*) / 4

URTQQEP *mp* = ∑*p, i* (RTQQEP *mp, p, i*) / 4

UDAES *mp* = ∑*p, h* (DAES *mp, p, h*)

UDAEP *mp* = ∑*p, h* (DAEP *mp, p, h*)

URTOBL *mp* = ∑*(j, k), h* (RTOBL*mp, (j, k), h*)

URTOBLLO *mp* = ∑*(j, k), h* (RTOBLLO*mp, (j, k), h*)

UDAOPT *mp* = ∑*(j, k), h* (DAOPT*mp, (j, k), h*)

UDAOBL *mp* = ∑*(j, k), h* (DAOBL*mp, (j, k), h*)

UOPTS *mp* = ∑*(j, k), h* (OPTS*mp, (j, k), h*)

UOBLS *mp* = ∑*(j, k), h* (OBLS*mp, (j, k), h*)

UOPTP *mp* = ∑*(j, k), h* (OPTP*mp, j, h*)

UOBLP *mp* = ∑*(j, k), h* (OBLP*mp, (j, k), h*)

UWSLTOT *mp* = (-1) \* ∑*r, b* (MEBL *mp, r, b*)

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| ***[NPRR917: Insert the formula “USOGTOT mp” and “USOCLTOT mp” below upon system implementation:]***  USOGTOT *mp* = ∑*gsc, b* (OFSOG *mp, gsc, b*) + ∑ *p, i* (RTMGSOGZ *mp, p, i*)  USOCLTOT *mp* = (-1) \* ∑*gsc, b* (WSOL *mp, gsc, b* + NWSOL *mp, gsc, b*) |

The above variables are defined as follows:

| **Variable** | **Unit** | **Definition** |
| --- | --- | --- |
| DURSCP *cp* | $ | *Default Uplift Ratio Share per Counter-Party*—The Counter-Party’s pro rata portion of the total short-pay amount for all Day-Ahead Market (DAM) and Real-Time Market (RTM) Invoices for a month. |
| TSPA | $ | *Total Short Pay Amount*—The total short-pay amount calculated by ERCOT to be collected through the Default Uplift Invoice process. |
| MMARS *cp* | None | *Maximum MWh Activity Ratio Share*—The Counter-Party’s pro rata share of Maximum MWh Activity. |
| MMA *cp* | MWh | *Maximum MWh Activity*—The maximum MWh activity of all Market Participants represented by the Counter-Party in the DAM, RTM and CRR Auction for a month. |
| MMATOT | MWh | *Maximum MWh Activity Total*—The sum of all Counter-Party’s Maximum MWh Activity. |
| RTMG *mp, p, r, i* | MWh | *Real-Time Metered Generation per Market Participant per Settlement Point per Resource*—The Real-Time energy produced by the Generation Resource *r* represented by Market Participant *mp*, at Resource Node *p*, for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE. |
| URTMG *mp* | MWh | *Uplift Real-Time Metered Generation per Market Participant*—The monthly sum of Real-Time energy produced by Generation Resources represented by Market Participant *mp*, excluding generation for RMR Resources and generation in RUC-Committed Intervals, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| RTDCIMP *mp, p, i* | MW | *Real-Time DC Import per QSE per Settlement Point*—The aggregated Direct Current Tie (DC Tie) Schedule submitted by Market Participant *mp,* as an importer into the ERCOT System through DC Tie *p*, for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE. |
| URTDCIMP *mp* | MW | *Uplift Real-Time DC Import per Market Participant*—The monthly sum of the aggregated DC Tie Schedule submitted by Market Participant *mp*, as an importer into the ERCOT System where the Market Participant is a QSE assigned to a registered Counter-Party. |
| RTAML *mp, p, i* | MWh | *Real-Time Adjusted Metered Load per Market Participant per Settlement Point*—The sum of the Adjusted Metered Load (AML) at the Electrical Buses that are included in Settlement Point *p* represented by Market Participant *mp* for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE. |
| URTAML *mp* | MWh | *Uplift Real-Time Adjusted Metered Load per Market Participant*—The monthly sum of the AML represented by Market Participant *mp*, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| RTQQES *mp, p, i* | MW | *QSE-to-QSE Energy Sale per Market Participant per Settlement Point*—The amount of MW sold by Market Participant *mp* through Energy Trades at Settlement Point *p* for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE. |
| URTQQES *mp* | MWh | *Uplift QSE-to-QSE Energy Sale per Market Participant*—The monthly sum of MW sold by Market Participant *mp* through Energy Trades, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| RTQQEP *mp, p, i* | MW | *QSE-to-QSE Energy Purchase per Market Participant per Settlement Point*—The amount of MW bought by Market Participant *mp* through Energy Trades at Settlement Point *p* for the 15-minute Settlement Interval *i*, where the Market Participant is a QSE. |
| URTQQEP *mp* | MWh | *Uplift QSE-to-QSE Energy Purchase per Market Participant*—The monthly sum of MW bought by Market Participant *mp* through Energy Trades, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| DAES *mp, p, h* | MW | *Day-Ahead Energy Sale per Market Participant per Settlement Point per hour*—The total amount of energy represented by Market Participant *mp*’s cleared Three-Part Supply Offers in the DAM and cleared DAM Energy-Only Offers at Settlement Point *p*, for the hour *h*, where the Market Participant is a QSE. |
| UDAES *mp* | MWh | *Uplift Day-Ahead Energy Sale per Market Participant*—The monthly total of energy represented by Market Participant *mp*’s cleared Three-Part Supply Offers in the DAM and cleared DAM Energy-Only Offer Curves, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| DAEP *mp, p, h* | MW | *Day-Ahead Energy Purchase per Market Participant per Settlement Point per hour*—The total amount of energy represented by Market Participant *mp*’s cleared DAM Energy Bids at Settlement Point *p* for the hour *h*, where the Market Participant is a QSE. |
| UDAEP *mp* | MWh | *Uplift Day-Ahead Energy Purchase per Market Participant*—The monthly total of energy represented by Market Participant *mp*’s cleared DAM Energy Bids, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| RTOBL *mp, (j, k), h* | MW | *Real-Time Obligation per Market Participant per source and sink pair per hour*—The number of Market Participant *mp*’s Point-to-Point (PTP) Obligations with the source *j* and the sink *k* settled in Real-Time for the hour *h*, and where the Market Participant is a QSE. |
| URTOBL *mp* | MWh | *Uplift Real-Time Obligation per Market Participant*—The monthly total of Market Participant *mp*’s PTP Obligations settled in Real-Time, counting the quantity only once per source and sink pair, and where the Market Participant is a QSE assigned to the registered Counter-Party. |
| RTOBLLO *q, (j, k)* | MW | *Real-Time Obligation with Links to an Option per QSE per pair of source and sink*⎯The total MW of the QSE’s PTP Obligation with Links to an Option Bids cleared in the DAM and settled in Real-Time for the source *j* and the sink *k* for the hour. |
| URTOBLLO *q, (j, k)* | MW | *Uplift Real-Time Obligation with Links to an Option per QSE per pair of source and sink*⎯The monthly total of Market Participant *mp*’s MW of PTP Obligation with Links to Options Bids cleared in the DAM and settled in Real-Time for the source *j* and the sink *k* for the hour, where the Market Participant is a QSE assigned to the registered Counter-Party. |
| DAOPT *mp, (j, k), h* | MW | *Day-Ahead Option per Market Participant per source and sink pair per hour*⎯The number of Market Participant *mp*’s PTP Options with the source *j* and the sink *k* owned in the DAM for the hour *h*, and where the Market Participant is a CRR Account Holder. |
| UDAOPT *mp* | MWh | *Uplift Day-Ahead Option per Market Participant*⎯The monthly total of Market Participant *mp*’s PTP Options owned in the DAM, counting the ownership quantity only once per source and sink pair, and where the Market Participant is a CRR Account Holder assigned to the registered Counter-Party. |
| DAOBL *mp, (j, k), h* | MW | *Day-Ahead Obligation per Market Participant per source and sink pair per hour*—The number of Market Participant *mp*’s PTP Obligations with the source *j* and the sink *k* owned in the DAM for the hour *h*, and where the Market Participant is a CRR Account Holder. |
| UDAOBL *mp* | MWh | *Uplift Day-Ahead Obligation per Market Participant*⎯The monthly total of Market Participant *mp*’s PTP Obligations owned in the DAM, counting the ownership quantity only once per source and sink pair, where the Market Participant is a CRR Account Holder assigned to the registered Counter-Party. |
| OPTS *mp, (j, k), a, h* | MW | *PTP Option Sale per Market Participant per source and sink pair per CRR Auction per hour*—The MW quantity that represents the total of Market Participant *mp*’s PTP Option offers with the source *j* and the sink *k* awarded in CRR Auction *a*, for the hour *h*, where the Market Participant is a CRR Account Holder. |
| UOPTS *mp* | MWh | *Uplift PTP Option Sale per Market Participant*—The MW quantity that represents the monthly total of Market Participant *mp*’s PTP Option offers awarded in CRR Auctions, counting the awarded quantity only once per source and sink pair, where the Market Participant is a CRR Account Holder assigned to the registered Counter-Party. |
| OBLS *mp, (j, k), a, h* | MW | *PTP Obligation Sale per Market Participant per source and sink pair per CRR Auction per hour*—The MW quantity that represents the total of Market Participant *mp*’s PTP Obligation offers with the source *j* and the sink *k* awarded in CRR Auction *a*, for the hour *h*, where the Market Participant is a CRR Account Holder. |
| UOBLS *mp* | MWh | *Uplift PTP Obligation Sale per Market Participant*—The MW quantity that represents the monthly total of Market Participant *mp*’s PTP Obligation offers awarded in CRR Auctions, counting the quantity only once per source and sink pair, where the Market Participant is a CRR Account Holder assigned to the registered Counter-Party. |
| OPTP *mp, (j, k), a, h* | MW | *PTP Option Purchase per Market Participant per source and sink pair per CRR Auction per hour*—The MW quantity that represents the total of Market Participant *mp*’s PTP Option bids with the source *j* and the sink *k* awarded in CRR Auction *a*, for the hour *h*, where the Market Participant is a CRR Account Holder. |
| UOPTP *mp* | MWh | *Uplift PTP Option Purchase per Market Participant*—The MW quantity that represents the monthly total of Market Participant *mp*’s PTP Option bids awarded in CRR Auctions, counting the quantity only once per source and sink pair, where the Market Participant is a CRR Account Holder assigned to the registered Counter-Party. |
| OBLP *mp, (j, k), a, h* | MW | *PTP Obligation Purchase per Market Participant per source and sink pair per CRR Auction per hour*—The MW quantity that represents the total of Market Participant *mp*’s PTP Obligation bids with the source *j* and the sink *k* awarded in CRR Auction *a*, for the hour *h*, where the Market Participant is a CRR Account Holder. |
| UOBLP *mp* | MWh | *Uplift PTP Obligation Purchase per Market Participant*—The MW quantity that represents the monthly total of Market Participant *mp*’s PTP Obligation bids awarded in CRR Auctions, counting the quantity only once per source and sink pair, where the Market Participant is a CRR Account Holder assigned to the registered Counter-Party. |
| UWSLTOT *mp* | MWh | *Uplift Metered Energy for Wholesale Storage Load at bus per Market Participant*⎯The monthly sum of Market Participant *mp*’s Wholesale Storage Load (WSL) energy metered by the Settlement Meter which measures WSL. |
| MEBL *mp, 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 Market Participant *mp*, Resource *r*, at bus *b*. |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ***[NPRR917: Insert the variables “*** ***USOGTOT mp”, “*** ***USOCLTOT mp”, “*** ***RTMGSOGZ mp. p, i”, “OFSOG mp, gsc, b”, “WSOL mp, gsc, b” and “NWSOL mp, gsc, b” below upon system implementation:]***   |  |  |  | | --- | --- | --- | | USOGTOT *mp* | MWh | *Uplift Real- Time Settlement Only Generator Site per Market Participant*—The monthly sum of Real-Time energy produced by SODGs, SOTGs, SODESs, or SOTESs represented by Market Participant *mp*, where the Market Participant is a QSE assigned to the registered Counter-Party. | | USOCLTOT *mp* | MWh | *Uplift Real-Time Settlement Only Charging Load per Market Participant*—The monthly sum of Real-Time charging Load by SODESs and SOTESs represented by Market Participant *mp*, where the Market Participant is a QSE assigned to the registered Counter-Party. | | RTMGSOGZ *mp. p, i* | MWh | *Real-Time Metered Generation from Settlement Only Generators Zonal per QSE per Settlement Point*— The total Real-Time energy produced by Settlement Only Transmission Self-Generators (SOTSGs) for the Market Participant *mp* in Load Zone Settlement Point *p*, for the 15-minute Settlement Interval. MWh quantities for Settlement Only Distribution Generators (SODGs) and Settlement Only Transmission Generators (SOTGs) that opted out of nodal pricing pursuant to Section 6.6.3.9, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG) or a Settlement Only Transmission Generator (SOTG), will also be included in this value. | | OFSOG *mp, gsc, b* | MWh | *Outflow as measured for an SODG, SOTG, SODES, or SOTES Site* ⎯The outflow as measured by the Settlement Meter(s) at Electrical Bus *b* for SODG, SOTG, SODES, or SOTES site *gsc* represented by the Market Participant *mp* for the 15-minute Settlement Interval.. | | WSOL *mp, gsc, b* | MWh | *WSL for an SODES or SOTES Site -* The WSL as measured for an for SODES or SOTES site *gsc* at Electrical Bus *b*, represented by the Market Participant *mp,* represented as a negative value, for the 15-minute Settlement Interval. | | NWSOL *mp, gsc, b* | MWh | *Non-WSL Settlement Only Charging Load for an SODES or SOTES Site -* The Non-WSL Settlement Only Charging Load as measured for an SODES or SOTES site *gsc* at Electrical Bus *b*, represented by the Market Participant *mp,* represented as a negative value, for the 15-minute Settlement Interval. | | | | |
| *cp* | none | A registered Counter-Party. |
| *mp* | none | A Market Participant that is a non-defaulting QSE or CRR Account Holder. |
| *j* | none | A source Settlement Point. |
| *k* | none | A sink Settlement Point. |
| *a* | none | A CRR Auction. |
| *p* | none | A Settlement Point. |
| *i* | none | A 15-minute Settlement Interval. |
| *h* | none | The hour that includes the Settlement Interval i. |
| *r* | none | A Resource. |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | ***[NPRR917: Insert the variables “gsc” and “b” below upon system implementation:]***   |  |  |  | | --- | --- | --- | | *gsc* | none | A generation site code. | | *b* | none | An Electrical Bus. | | | | |

(3) The uplifted short-paid amount will be allocated to the Market Participants (QSEs or CRR Account Holders) assigned to a registered Counter-Party based on the pro-rata share of MWhs that the QSE or CRR Account Holder contributed to its Counter-Party’s maximum MWh activity ratio share.

(4) Any uplifted short-paid amount greater than $2,500,000 must be scheduled so that no amount greater than $2,500,000 is charged on each set of Default Uplift Invoices until ERCOT uplifts the total short-paid amount. ERCOT must issue Default Uplift Invoices at least 30 days apart from each other.

(5) ERCOT shall issue Default Uplift Invoices no earlier than 90 days following a short-pay of a Settlement Invoice on the date specified in the Settlement Calendar. The Invoice Recipient is responsible for accessing the Invoice on the MIS Certified Area once posted by ERCOT.

(6) Each Default Uplift Invoice must contain:

(a) The Invoice Recipient’s name;

(b) The ERCOT identifier (Settlement identification number issued by ERCOT);

(c) Net Amount Due or Payable – the aggregate summary of all charges owed by a Default Uplift Invoice Recipient;

(d) Run Date – the date on which ERCOT created and published the Default Uplift Invoice;

(e) Invoice Reference Number – a unique number generated by the ERCOT applications for payment tracking purposes;

(f) Default Uplift Invoice Reference – an identification code used to reference the amount uplifted;

(g) Payment Date and Time – the date and time that Default Uplift Invoice amounts must be paid;

(h) Remittance Information Details – details including the account number, bank name, and electronic transfer instructions of the ERCOT account to which any amounts owed by the Invoice Recipient are to be paid or of the Invoice Recipient’s account from which ERCOT may draw payments due; and

(i) Overdue Terms – the terms that would apply if the Market Participant makes a late payment.

(7) Each Invoice Recipient shall pay any net debit shown on the Default Uplift Invoice on the payment due date whether or not there is any Settlement and billing dispute regarding the amount of the debit.

***10.2.3 ERCOT-Polled Settlement Meters***

(1) ERCOT shall poll Metering Facilities that meet any one of the following criteria:

(a) Generation connected directly to the ERCOT Transmission Grid, unless the generation is participating in a current ERS Contract Period and the generation only exports energy to the ERCOT Transmission Grid during equipment testing, an ERS deployment, or an ERS test;

(b) Auxiliary meters used for generation netting by ERCOT;

(c) Generation delivering 10 MW or more to the ERCOT System, unless the generation is participating in a current ERS Contract Period and the generation only exports energy to the ERCOT System during equipment testing, an ERS deployment, or an ERS test;

(d) Generation participating in any Ancillary Service market;

(e) NOIE points connected bi-directionally to the ERCOT System, unless the bi-directional energy flows are the sole result of generation interconnected to a TDSP owned Distribution System behind a NOIE point of delivery metering point;

(f) Direct Current Ties (DC Ties);

(g) Metering required to determine the WSL or Non-WSL Settlement Only Charging Load associated to a SODES or SOTES; and

(h) WSL associated to a generation site.

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| ***[NPRR1002 and NPRR1020: Replace applicable portions of item (h) above with the following upon system implementation of NPRR1002; or upon implementation of NPRR1020 and upon implementation of necessary revisions to the SMOG, respectively:]***  (h) Metering required to determine WSL associated with an Energy Storage Resource (ESR). |

(2) Additionally, ERCOT shall poll any SODG or NOIE metering point at the request of such Entity, provided the Metering Facility meets all requirements and approvals associated with EPS metering requirements of this Section and the SMOG. Load Resources of 10 MW or more on the ERCOT System, may, at their option have an EPS Meter.

**10.2.3.1 Entity EPS Responsibilities**

(1) The following defines the responsibilities of Entities regarding EPS metering:

(a) EPS Meters must be polled directly by ERCOT, which shall then convert the raw data to Settlement Quality Meter Data in accordance with this Section, Section 11, Data Acquisition and Aggregation, and the SMOG.

(b) A TSP or DSP shall have EPS Metering Facilities installed and maintained under the supervision of a TSP or DSP “EPS Meter Inspector,” which is defined as an employee or agent of the TSP or DSP who has received EPS training from ERCOT, and is described further herein.

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| ***[NPRR1020: Replace paragraph (b) above with the following upon system implementation*** ***and upon implementation of necessary revisions to the SMOG:]***  (b) A TSP or DSP shall have EPS Metering Facilities installed and maintained under the supervision of a TSP or DSP “EPS Meter Inspector,” which is defined as an employee or agent of the TSP or DSP who has received EPS training from ERCOT, and is described further herein. This requirement does not apply to Resource Entity-owned Metering Facilities used to measure, calculate, or telemeter ESR, SODES, or SOTES auxiliary Load pursuant to Section 10.2.4, Resource Entity Calculation and Telemetry of ESR Auxiliary Load Values. |

(c) Each TSP and DSP shall install, control, and maintain the meters, recorders, instrument transformers, wiring, communications, and other miscellaneous equipment required to measure electrical energy, as described in this Section and SMOG.

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| ***[NPRR1020: Replace paragraph (c) above with the following upon system implementation*** ***and upon implementation of necessary revisions to the SMOG:]***  (c) Each TSP and DSP shall install, control, and maintain the meters, recorders, instrument transformers, wiring, communications, and other miscellaneous equipment required to measure electrical energy, as described in this Section and SMOG, except for Resource Entity-owned equipment used to measure, calculate, or telemeter an auxiliary Load value for an ESR, SODES, or SOTES pursuant to Section 10.2.4. |

(d) Each TSP and DSP shall install and maintain a Back-up Meter(s) at each EPS Meter location for Resources, auxiliary netting, and bi-directional meter points. A “Back-up Meter” is defined as a redundant revenue quality EPS Meter connected at the same metering point as the primary EPS Meter and meeting the requirements defined in the SMOG.

(e) Costs incurred in the installation and maintenance of EPS metered Facilities and communications will be the responsibility of the TSP or DSP except for incremental costs incurred for functions not required for the energy settlement as required by these Protocols. These incremental costs shall be borne by the Entities requesting the service, as per the TSP’s or DSP’s tariffs.

(f) Specific operating practices for EPS Metering Facilities are included in the SMOG.

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| ***[NPRR1020: Insert Section 10.2.4 below upon system implementation*** ***and upon implementation of necessary revisions to the SMOG:]***  ***10.2.4 Resource Entity Calculation and Telemetry of ESR, SODES, or SOTES Auxiliary Load Values***  (1) When the Resource Entity certifies, the interconnecting TDSP confirms by approving the metering design, and, based on the information provided by the TDSP as part of the EPS Design Proposal, ERCOT agrees that metering of an ESR’s WSL separate from the ESR’s, SODES’s, or SOTES’s auxiliary Load is not feasible based on the ESR’s, SODES’s, or SOTES’s physical design, the Resource Entity for that ESR, SODES, or SOTES shall be permitted to calculate the auxiliary Load using measurements from its own internal sensors and telemeter a Real-Time aggregated value for that Load to the TDSP’s EPS Meter. The Resource Entity may telemeter a zero Load value only when the ESR, SODES, or SOTES is discharging more than the calculated auxiliary Load. The methodology by which the auxiliary Load is calculated is subject to ERCOT approval.  (2) An officer of the Resource Entity shall annually attest to the methodology and validity of the auxiliary Load calculation, as further described in the SMOG. The Resource Entity shall include with its annual attestation the findings of an independent audit performed by a registered Texas Professional Engineer confirming the auxiliary Load calculation does not understate the Load value. The audit shall be based on laboratory testing that reflects the anticipated field conditions of the same model of sensor as that used by the Resource Entity or validation using measurements by other devices over the past year, as further described in the SMOG. The audit shall evaluate the impact of any degradation in accuracy of the sensors over time.  (3) If the Resource Entity is unable to provide the attestation and audit findings meeting the requirements of paragraph (2) above, it shall either reconfigure the Resource Entity’s site and resubmit its meter design within 30 days to allow for separately metering the WSL or forfeit WSL treatment.  (4) ERCOT may conduct an audit of the Resource Entity’s processes, equipment, and calculation of the auxiliary Load.  (5) The TSP or DSP shall assign all costs required for separately metering the auxiliary Load for WSL treatment to the EPS Meter to the Resource Entity. |

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| ***[NPRR1020: Insert Section 10.2.4.1 below upon system implementation*** ***and upon implementation of necessary revisions to the SMOG:]***  **10.2.4.1 Responsibilities for Resource Entity Calculation and Telemetry of ESR, SODES, or SOTES Auxiliary Load Values**  (1) For each site at which a Resource Entity telemeters its auxiliary Load value, as permitted by Section 10.2.4:  (a) The Resource Entity shall:  (i) Provide supporting information on the equipment, configuration, drawings and processes used to calculate the telemetry signal, including supporting information on the calculation of the telemetry signal for inclusion in the EPS Design Proposal.  (ii) Provide documentation of the auxiliary Load calculation methodology as defined in this Section and the SMOG.  (iii) Install, control, and maintain the sensors, instrumentation, wiring, communications, and other equipment required to calculate and provide the telemetry signal.  (iv) Provide and update contact information for a person designated for communication regarding the auxiliary Load supporting information and data.  (v) Act in accordance with any TDSP requirements concerning EPS Meters and Metering Facilities in the Protocols and SMOG that pertain to the following issues:   1. calculation of Load values and data estimation issues; 2. the provision of notice to ERCOT regarding any outage or any other issue affecting the accuracy of the Load calculation or the availability of the telemetry of the Load value; and 3. the implementation of any proposed change to the calculation or equipment, as documented in the EPS Design Proposal; and   (vi) Provide any information requested by ERCOT or the TDSP with respect to the measurement, calculation, and/or telemetry of the auxiliary Load value.  (b) The interconnecting TDSP shall:  (i) Use an EPS Meter to calculate 15 minute energy values from the Resource Real-Time telemetry signal for the auxiliary Load and store the data in the EPS Meter for retrieval by the ERCOT Meter Data Acquisition System (MDAS); and  (ii) Include an auxiliary Load metering point on the EPS Design Proposal that represents the calculation of the telemetry signal.  (c) ERCOT shall:  (i) Review the Resource-provided data on the calculation of the telemetry signal submitted as part of the EPS Design Proposal to ensure compliance with defined rules in this Section and the SMOG; and  (ii) Request assistance and information from the Resource-designated contact for items related to the telemetry. |

**10.3.2.3 Generation Netting for ERCOT-Polled Settlement Meters**

(1) At Generation Resource Facilities, generation and associated Loads, including construction and maintenance Load that is netted with existing generation auxiliaries, must be metered at their POIs to the ERCOT Transmission Grid. Interval Data Recorders (IDRs) must be used to determine generator output or Load usage. In the intervals where the generation output exceeds the Load, the net must be settled as generation. In the intervals where the Load exceeds the generation output, the net must be settled as Load and carry any applicable Load shared charges and credits.

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| ***[NPRR917: Replace paragraph (1) above with the following upon system implementation:]***  (1) At Generation Resource and Settlement Only Generator (SOG) Facilities, generation and associated Loads, including construction and maintenance Load that is netted with existing generation auxiliaries, must be metered at their POIs to the ERCOT Transmission Grid or Service Delivery Point. Interval Data Recorders (IDRs) must be used to determine generator output or Load usage. In the intervals where the generation output exceeds the Load, the net must be settled as generation. In the intervals where the Load exceeds the generation output, the net must be settled as Load and carry any applicable Load shared charges and credits. |

(2) For Settlement purposes, generation netting is not allowed except under one of the following conditions:

(a) Single POI with delivered and received metering data channels;

(b) Multiple POIs where the Loads and generator output are electrically connected to a common switchyard, as defined in paragraph (6) below. In addition, there must be sufficient generator capacity to serve all plant Loads for netting to occur;

(c) A Qualifying Facility (QF) with POI(s), where the QF is selling energy to a thermal host, may net the Load meters of the thermal host with the QF’s generation meters when the Load and generation are electrically connected to a common switchyard. In instances in which Load is served by new on-site generation through a common switchyard, the TSP or DSP may install monitoring equipment necessary for measuring Load to determine stranded cost charges, if any are applicable, as determined under the Public Utility Regulatory Act (PURA) and applicable Public Utility Commission of Texas (PUCT) rules. For purposes of this Section, new on-site generation has the meaning as contained in Public Utility Regulatory Act, Tex. Util. Code Ann. §§ 39.252 and 39.262(k) (Vernon 1998 & Supp. 2007) (PURA); or

(d) For Generation Resources and/or Load with flow-through on a private, contiguous transmission system (not included in a TSP or DSP rate base) and in a configuration existing as of October 1, 2000, the meters at the interconnections with the ERCOT Transmission Grid may be netted for the purpose of determining Generation Resources or Load. For Settlement purposes, when the net is a Load, the metered interconnection points must be assigned to the same Load Zone and Unaccounted for Energy (UFE) zone.

(e) A QF that meets the requirements for a small power production facility under 18 C.F.R. § 292.204 and will lawfully provide energy to a Customer behind a single POI with delivered and received metering data channels.

(3) For generation sites with EPS Meters that measure Wholesale Storage Load (WSL), each energy storage Load Resource must be separately metered from all other Loads and generation:

(a) For configurations where the WSL is not at the POI, it must be separately metered behind a single POI metering point; and

(b) WSL for a compressed air energy storage Load Resource is exempt from the requirement to be electrically connected to a common switchyard, as defined in paragraph (6) below.

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| ***[NPRR1020: Replace paragraph (3) above with the following upon system implementation*** ***and upon implementation of necessary revisions to the SMOG:]***  (3) For Energy Storage Resource (ESR), SODES, or SOTES sites, Wholesale Storage Load (WSL) must be separately metered from all other Loads and generation, and must be metered using EPS Metering Facilities.  (a) For configurations where the Resource Entity telemeters an auxiliary Load value to the EPS Meter:  (i) The total energy into the ESR, SODES, or SOTES must be separately metered from all other Loads and generation, and must be metered using EPS Metering Facilities and  (ii) The auxiliary Load energy shall be stored in the EPS Meter’s IDR, per channel assignments defined in the SMOG.  (b) For configurations where the WSL is not at the POI, it must be metered behind a single POI metering point, per the requirements in paragraph (3) or (3)(a) above; and  (c) WSL for a compressed air energy storage Load Resource is exempt from the requirement to be electrically connected to a common switchyard, as defined in paragraph (6) below. |

(4) ERCOT shall maintain descriptions of the Metering Facilities of all common switchyards that contain multiple POIs of Loads (ESI IDs) and generation meters (EPS). The description is limited to identifying the Entities within a common switchyard and a simplified diagram showing the metering configuration of all Supervisory Control and Data Acquisition (SCADA) and Settlement Metering points.

(5) All Load(s) included in the netting arrangement for an EPS Metering Facility shall only be electrically connected to the ERCOT Transmission Grid through the EPS metering point(s) for such Facility.  Such Loads shall not be electrically connected to the ERCOT Transmission Grid through electrical connections that are not metered by the EPS metering point(s) for the Facility.

(6) For purposes of this Section, a common switchyard is defined as an electric substation Facility where the POI for Load and Generation Resources are located at the same Facility but where the interconnection points are physically not greater than 400 yards apart. The physical connections of the Load to its POI and the Generation Resource to its POI cannot be Facilities that have been placed in a TSP’s or DSP’s rate base.

***10.9.1 ERCOT-Polled Settlement Meters***

(1) The TSP or DSP for ERCOT-Polled Settlement (EPS) Meters shall ensure that the EPS Metering Facilities comply with this Section and the Settlement Metering Operating Guide (SMOG).

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| ***[NPRR1020: Replace paragraph (1) above with the following upon system implementation*** ***and upon implementation of necessary revisions to the SMOG:]***  (1) The TSP or DSP for ERCOT-Polled Settlement (EPS) Meters shall ensure that the EPS Metering Facilities comply with this Section and the Settlement Metering Operating Guide (SMOG). This requirement does not apply to Resource Entity-owned Metering Facilities used to measure, calculate, or telemeter Energy Storage Resource (ESR), SODES, or SOTES auxiliary Load pursuant to Section 10.2.4, Resource Entity Calculation and Telemetry of ESR Auxiliary Load Values. |

(2) IDRs used for settlement of EPS Metering Facilities shall:

(a) Capture energy consumption and/or production in increments consistent with ERCOT defined Settlement Interval;

(b) Be able to capture energy in increments of five minutes (excluding memory allocation) for new and replacement IDRs used for settlement;

(c) Provide interval data for daily polling on a schedule that supports ERCOT’s requirements (typically a daily cycle);

(d) Be capable of having data retrieved via telemetry by Meter Data Acquisition System (MDAS);

(e) Have battery or other energy-storage back-up to maintain time during power outages;

(f) Have remote time synchronization capability compatible with the MDAS;

(g) Maintain meter clocks on a time reference standard that enables ERCOT MDAS to maintain the IDR data on Central Prevailing Time (CPT). The meter clock shall be synchronized to within +/- 1% of the Settlement Interval when compared with the National Institute of Standards and Technology (NIST) Atomic Clock. ERCOT shall perform the time synchronization for meters at the time of the interrogation if the meter is outside tolerance; and,

(h) Divide each hour into Settlement Intervals ending as follows:

XX:15:00

XX:30:00

XX:45:00

XX:00:00

***11.1.6 ERCOT Polled Settlement Meter Netting***

(1) As allowed by Section 10, Metering, of these Protocols, ERCOT will perform the approved netting schemes, which sum the meters at a given Generation Resource site.

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| ***[NPRR1002: Replace paragraph (1) above with the following upon system implementation:]***  (1) As allowed by Section 10, Metering, of these Protocols, ERCOT will perform the approved netting schemes, which sum the meters at a given Generation Resource, or Energy Storage Resource (ESR) site. |

(2) Both Load consumption and Generation Resource production meters will be combined together to obtain a total amount of Load or Resource.

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| ***[NPRR1002: Replace paragraph (2) above with the following upon system implementation:]***  (2) Both Load consumption and generation production meters will be combined together to obtain a total amount of Load or generation. |

(3) For a Generation Resource site with Wholesale Storage Load (WSL):

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| ***[NPRR1002: Replace paragraph (3) above with the following upon system implementation:]***  (3) For an ESR site: |

(a) WSL is measured by the corresponding EPS Meter.

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| ***[NPRR1020: Replace paragraph (a) above with the following upon system implementation and upon*** ***implementation of necessary revisions to the Settlement Metering Operating Guide (SMOG):]***  (a) WSL is measured by the corresponding EPS Meter, except that when a Resource Entity for an Energy Storage Resource (ESR) communicates its auxiliary Load value to the EPS Meter, WSL is calculated by subtracting the auxiliary Load from the total Load measured by the corresponding EPS meter. If the calculated auxiliary Load is greater than the total Load, WSL shall be zero. |

(b) For WSL that is metered behind the POI metering point, the WSL will be added back into the POI metering point to determine the net flows for the POI metering point.

(c) For WSL that is separately metered at the POI, the WSL will not be included in the determination of whether the generation site is net generation or net Load for the purpose of Settlement.

(4) For an SODES or SOTES that has been approved for WSL treatment and has a single POI or Service Delivery Point:

(a) For withdrawals from the ERCOT System consisting of only WSL or WSL in combination with auxiliary Load:

(i) WSL is measured by the corresponding EPS Meter, except when a Resource Entity communicates its auxiliary Load value to the EPS Meter, WSL is calculated by subtracting the auxiliary Load from the total Load measured by the corresponding EPS meter. If the calculated auxiliary Load is greater than the total Load, WSL shall be set to zero.

(ii) For measured or calculated WSL that is behind the POI or Service Delivery Point, the WSL will be added back into the POI or Service Delivery Point metering point to determine the net flows for the POI or Service Delivery Point metering point.

(b) For withdrawals from the ERCOT System that include Load other than WSL Load or auxiliary Load:

(i) The charging Load is measured by the corresponding EPS Meter, except that when the Resource Entity communicates its auxiliary Load value to the EPS Meter, the charging Load is calculated by subtracting the auxiliary Load from the total SODES or SOTES Load measured by the corresponding EPS meter. If the calculated auxiliary Load is greater than the total SODES or SOTES Load, the charging load shall be set to zero.

(ii) Where injections are exclusively the result of generation from an SODES or SOTES, the WSL quantity shall be determined through the use of a generation accumulator, which is calculated as the accumulated output measured at the POI or Service Delivery Point minus the accumulated charging Load receiving WSL treatment. The charging load that is less than or equal to the generation accumulator will be settled as WSL for each 15-minute interval.

(iii) Where injections are the result of a combination of SODES or SOTES and non-SODES or non-SOTES generation, the output channel of the EPS meter that measures charging Load is required to be used for Settlement. For these sites, the WSL quantity shall be determined through the use of a generation accumulator, which is calculated as the lesser of (i) the accumulated SODES or SOTES output or (ii) the accumulated output measured at the POI or Service Delivery Point minus the accumulated charging load receiving WSL treatment. The charging load that is less than or equal to the generation accumulator will be settled as WSL for each 15-minute interval.

(iv) For measured or calculated charging Load that is behind the POI or Service Delivery Point, the charging Load will be added back into the POI or Service Delivery Point metering point to determine the net flows for the POI or Service Delivery Point metering point.

(5) For an SODES or SOTES that either has not elected or has not been approved for WSL treatment and has a single POI or Service Delivery Point:

(a) For withdrawals from the ERCOT System consisting of only charging Load or charging Load in combination with auxiliary Load, the Non-WSL Settlement Only Charging Load for the 15-minute Settlement Interval shall be determined as follows:

(i) The metered charging Load that would otherwise be eligible for WSL; or

(ii) The total metered SODES or SOTES Load minus auxiliary Load, where auxiliary Load is calculated as the greater of the following:

(A) The lesser of the total metered Load or X MWh, where X is calculated as 15% of the nameplate capacity of the ESS multiplied by 0.25; or

(B) 15% of the total SODES or SOTES metered Load.

(b) For withdrawals from the ERCOT System that include Load other than Non-WSL Settlement Only Charging Load or auxiliary Load, the Non-WSL Settlement Only Charging Load for the 15-minute settlement interval shall be determined as follows:

(i) Where injections are exclusively the result of generation from an SODES or SOTES, the Non-WSL Settlement Only Charging Load quantity shall be determined through the use of a generation accumulator, which is calculated as the accumulated output measured at the POI or Service Delivery Point minus the metered or calculated charging load determined in option (A) or (B) below:

(A) Where the charging Load is separately metered, the accumulated metered charging Load that would otherwise be eligible for WSL; or

(B) Where the charging Load is not separately metered, the accumulated total metered SODES or SOTES Load minus auxiliary Load, where auxiliary Load is calculated as the greater of the following:

(1) The lesser of the total SODES or SOTES metered Load or X MWh, where X is calculated as 15% of the nameplate capacity of the SODES or SOTES multiplied by 0.25; or

(2) 15% of the total SODES or SOTES metered Load.

(ii) Where injections are the result of a combination of generation from SODES or SOTES and other generating facilities, the output channel of the EPS meter that measures charging Load is required to be used for Settlement. For these sites, the Non-WSL Settlement Only Charging Load quantity shall be determined through the use of a generation accumulator, which is calculated as the lesser of (a) the accumulated SODES or SOTES output or (b) the accumulated output measured at the POI or Service Delivery Point minus:

(A) Where the charging Load is separately metered, the accumulated metered charging Load that would otherwise be eligible for WSL; or

(B) Where the charging Load is not separately metered, the accumulated total metered SODES or SOTES Load minus auxiliary Load, where auxiliary Load is calculated as the greater of the following:

(1) The lesser of the total metered Load or X MWh, where X is calculated as 15% of the nameplate capacity of the SODES or SOTES multiplied by 0.25; or

(2) 15% of the total SODES or SOTES metered Load.

(iii) For each 15-minute interval, the metered or calculated charging load that is less than or equal to the generation accumulator will be settled as Non-WSL Settlement Only Charging Load.

***16.11.4.3.2 Real-Time Liability Estimate***

(1) ERCOT shall estimate RTL for an Operating Day as the sum of estimates for the following RTM Settlement charges and payments:

(a) Section 6.6.3.1, Real-Time Energy Imbalance Payment or Charge at a Resource Node, using Real-Time Metered Generation (RTMG) as generation estimate;

(b) Section 6.6.3.2, Real-Time Energy Imbalance Payment or Charge at a Load Zone, using 14 day or seven day old LRS for Load estimate;

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| ***[NPRR829: Replace item (b) above with the following upon system implementation:]***  (b) Section 6.6.3.2, Real-Time Energy Imbalance Payment or Charge at a Load Zone, using 14 day or seven day old LRS for Load estimate and Real-Time telemetry of net generation as the generation estimate; |

(c) Section 6.6.3.3, Real-Time Energy Imbalance Payment or Charge at a Hub;

(d) Section 6.6.3.4, Real-Time Energy Payment for DC Tie Import;

(e) Section 6.6.3.6, Real-Time Energy Charge for DC Tie Export Represented by the QSE Under the Oklaunion Exemption;

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| ***[NPRR917: Insert item (f) below upon system implementation and renumber accordingly:]***  (f) Section 6.6.3.9, Real-Time Payment or Charge for Energy from a Settlement Only Distribution Generator (SODG), Settlement Only Transmission Generator (SOTG), Settlement Only Distribution Energy Storage (SODES), or Settlement Only Transmission Energy Storage (SOTES), using the Real-Time telemetry, if provided, of net generation as the outflow estimate and the Real-Time Price for each SODG, SOTG, SODES, or SOTES site; |

(f) Section 6.6.4, Real-Time Congestion Payment or Charge for Self-Schedules; and

(g) Section 7.9.2.1, Payments and Charges for PTP Obligations Settled in Real-Time.