|  |  |  |  |
| --- | --- | --- | --- |
| NPRR Number | [1196](https://www.ercot.com/mktrules/issues/NPRR1196) | NPRR Title | Correction of NCLR Ancillary Service Failed Quantity Calculations under NPRR1149 |
| Date Posted | August 24, 2023 |
|  |  |
| Requested Resolution  | Normal |
| Nodal Protocol Sections Requiring Revision  | 6.7.3, Charges for Ancillary Service Capacity Replaced Due to Failure to Provide |
| Related Documents Requiring Revision/Related Revision Requests | None |
| Revision Description | This Nodal Protocol Revision Request (NPRR) makes corrections and updates to equations used to determine Ancillary Service Failed Quantity calculations for Load Resources other than Controllable Load Resources (“NCLRs”) which were developed under NPRR1149, Implementation of Systematic Ancillary Service Failed Quantity Charges. Specific Protocol changes include:* Updates to the calculation of Ancillary Service Failed Quantities to account for the allowances and restrictions on Ancillary Services that NCLRs can and cannot carry simultaneously with the implementation of ERCOT Contingency Reserve Service (ECRS);
* Updates to specify the snapshot components to be used for the “Telemetered Ancillary Service for the NCLRs As Calculated” variable; and
* Inclusion of an additional non-zero check to be added for the “Telemetered ECRS Responsibility for the Resource As Calculated” variable.
 |
| Reason for Revision |  Addresses current operational issues. Meets Strategic goals (tied to the [ERCOT Strategic Plan](https://www.ercot.com/files/docs/2018/12/13/ERCOT_Strategic_Plan_2019-2023.pdf) or directed by the ERCOT Board). Market efficiencies or enhancements Administrative Regulatory requirements Other: (explain)*(please select all that apply)* |
| Business Case | In September 2022, ERCOT filed NPRR1149. NPRR1149 was approved in March 2023 and in part provided for charges to a Qualified Scheduling Entity (QSE) for an Ancillary Service failed quantity if the QSE did not meet its Ancillary Service Supply Responsibility in Real-Time. The Protocols changes approved in NPRR1149 included provisions that would go into effect upon implementation of the new Ancillary Service, ERCOT Contingency Reserve Service (ECRS). With the implementation of ECRS in June 2023, NCLRs may simultaneously provide Responsive Reserve (RRS) and ECRS, but an NCLR may not simultaneous provide ECRS and Non-Spin, as stated in paragraph (6) of Section 4.4.7.2.1, Ancillary Service Offer Criteria. This NPRR corrects the calculation of Ancillary Service failed quantity for an NCLR when it is providing ECRS and RRS simultaneously and removes the calculation formula which assumed that ECRS and Non-Spin could be provided simultaneously by an NCLR.This NPRR also specifies the snapshot components to be used for calculating the telemetered Ancillary Service for an NCLR and adds an additional non-zero check for the telemetered ECRS Ancillary Service Resource Responsibility for an NCLR. These changes are proposed in order to provide more transparency regarding how ERCOT calculates, for an NCLR, the Telemetered Responsive Reserve Responsibility for the Resource as Calculated. |

|  |
| --- |
| Sponsor |
| Name | Jian Chen |
| E-mail Address | Jian.Chen@ercot.com |
| Company | ERCOT |
| Phone Number | 512-248-4290 |
| Cell Number |  |
| Market Segment | Not applicable |

|  |
| --- |
| **Market Rules Staff Contact** |
| **Name** | Cory Phillips |
| **E-Mail Address** | cory.phillips@ercot.com |
| **Phone Number** | 512-248-6464 |

|  |
| --- |
| Proposed Protocol Language Revision |

6.7.3 Charges for Ancillary Service Capacity Replaced Due to Failure to Provide

(1) A charge to each QSE that fails on its Ancillary Service Supply Responsibility, whether or not a SASM is executed due to its failure to supply, is calculated based on the greatest of the MCPC in the Day-Ahead Market (DAM) or any SASM for the same Operating Hour. Included in the failed quantity is the charge to each QSE that reduces its Ancillary Service Supply Responsibility by an RSASM, which is calculated based on the cleared MCPC associated with the RSASM. By service, the charge to each QSE for a given Operating Hour is calculated as follows:

(a) The total charge of failure on Ancillary Service Supply Responsibility for Reg-Up by QSE, if applicable:

**RUFQAMTQSETOT *q* = RUFQAMT *q +* RRUFQAMT *q***

Where:

RUFQAMT *q* = ((MCPCRU *m*) \* RUFQ *q*)

RRUFQAMT *q* = MCPCRU *rs* \* RRUFQ *q,* *rs*

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| Variable | Unit | Description |
| RUFQAMTQSETOT *q* | $ | *Reg-Up Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RRUFQAMT *q* | $ | *Reconfiguration Reg-Up Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RUFQAMT *q* | $ | *Reg-Up Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| MCPCRU *m* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Up by market—*The MCPC for Reg-Up in the market *m*, for the hour. |
| MCPCRU *rs* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Up by RSASM—*The MCPC for Reg-Up in the RSASM *rs*, for the hour. |
| RUFQ *q* | MW | *Reg-Up Failure Quantity per QSE—*QSE *q* total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RRUFQ *q, rs* | MW | *Reconfiguration Reg-Up Failure Quantity per QSE—*QSE *q* total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| *rs* | none | The RSASM for the given Operating Hour. |
| *m* | none | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | none | A QSE. |

(b) The total charge of failure on Ancillary Service Supply Responsibility for Reg-Down by QSE, if applicable:

**RDFQAMTQSETOT *q* = RDFQAMT *q +* RRDFQAMT *q***

Where:

RDFQAMT *q* = ((MCPCRD *m*) \* RDFQ *q*)

RRDFQAMT *q* = MCPCRD *rs* \* RRDFQ *q,* *rs*

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| Variable | Unit | Description |
| RDFQAMTQSETOT *q* | $ | *Reg-Down Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RRDFQAMT *q* | $ | *Reconfiguration Reg-Down Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RDFQAMT *q* | $ | *Reg-Down Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| MCPCRD *m* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Down by market—*The MCPC for Reg-Down in the market *m*, for the hour. |
| MCPCRD *rs* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Down by RSASM—*The MCPC for Reg-Down in the RSASM *rs*, for the hour. |
| RDFQ *q* | MW | *Reg-Down Failure Quantity per QSE*—QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RRDFQ *q, rs* | MW | *Reconfiguration Reg-Down Failure Quantity per QSE*—QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| *rs* | none | The RSASM for the given Operating Hour. |
| *m* | none | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | none | A QSE. |

(c) The total charge of failure on Ancillary Service Supply Responsibility for RRS by QSE, if applicable:

**RRFQAMTQSETOT *q* = RRFQAMT *q +* RRRFQAMT *q***

Where:

RRFQAMT *q* = ((MCPCRR *m*) \* RRFQ *q*)

RRRFQAMT *q* = MCPCRR *rs* \* RRRFQ *q,* *rs*

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| Variable | Unit | Description |
| RRFQAMTQSETOT *q* | $ | *Responsive Reserve Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RRRFQAMT *q* | $ | *Reconfiguration Responsive Reserve Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RRFQAMT *q* | $ | *Responsive Reserve Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| MCPCRR *m* | $/MW per hour | *Market Clearing Price for Capacity for Responsive Reserve per market—*The MCPC for RRS in the market *m*, for the hour. |
| MCPCRR *rs* | $/MW per hour | *Market Clearing Price for Capacity for Responsive Reserve per RSASM—*The MCPC for RRS in the RSASM *rs*, for the hour. |
| RRFQ *q* | MW | *Responsive Reserve Failure Quantity per QSE -* QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RRRFQ *q, rs* | MW | *Reconfiguration Responsive Reserve Failure Quantity per QSE—*QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| *rs* | none | The RSASM for the given Operating Hour. |
| *m* | none | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | none | A QSE. |

(d) The total charge of failure on Ancillary Service Supply Responsibility for Non-Spin by QSE, if applicable:

**NSFQAMTQSETOT *q* = NSFQAMT *q +* RNSFQAMT *q***

Where:

NSFQAMT *q* = ((MCPCNS *m*) \* NSFQ *q*)

RNSFQAMT *q* = MCPCNS *rs* \* RNSFQ *q,* *rs*

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| Variable | Unit | Description |
| NSFQAMTQSETOT *q* | $ | *Non-Spin Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| RNSFQAMT *q* | $ | *Reconfiguration Non-Spin Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| NSFQAMT *q* | $ | *Non-Spin Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| MCPCNS *m* | $/MW per hour | *Market Clearing Price for Capacity for Non-Spin by market—*The MCPC for Non-Spin in the market *m*, for the hour. |
| MCPCNS *rs* | $/MW per hour | *Market Clearing Price for Capacity for Non-Spin by RSASM—*The MCPC for Non-Spin in the RSASM *rs*, for the hour. |
| NSFQ *q* | MW | *Non-Spin Failure Quantity per QSE—*QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| RNSFQ *q, rs* | MW | *Reconfiguration Non-Spin Failure Quantity per QSE—*QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| *rs* | None | The RSASM for the given Operating Hour. |
| *m* | None | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | None | A QSE. |

(e) The total charge of failure on Ancillary Service Supply Responsibility for ECRS by QSE, if applicable:

**ECRFQAMTQSETOT *q* = ECRFQAMT *q +*RECRFQAMT *q***

Where:

ECRFQAMT *q* = ((MCPCECR *m*) \* ECRFQ *q*)

RECRFQAMT *q* = MCPCECR *rs* \* RECRFQ *q,* *rs*

The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| ECRFQAMTQSETOT *q* | $ | *ERCOT Contingency Reserve Service Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| RECRFQAMT *q* | $ | *Reconfiguration ERCOT Contingency Reserve Service Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| ECRFQAMT *q* | $ | *ERCOT Contingency Reserve Service Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| MCPCECR *m* | $/MW per hour | *Market Clearing Price for Capacity for ERCOT Contingency Reserve Service per market—*The MCPC for ECRS in the market *m*, for the hour. |
| MCPCECR *rs* | $/MW per hour | *Market Clearing Price for Capacity for ERCOT Contingency Reserve Service per RSASM—*The MCPC for ECRS in the RSASM *rs*, for the hour. |
| ECRFQ *q* | MW | *ERCOT Contingency Reserve Service Failure Quantity per QSE -* QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| RECRFQ *q, rs* | MW | *Reconfiguration ERCOT Contingency Reserve Service Failure Quantity per QSE—*QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| *rs* | none | The RSASM for the given Operating Hour. |
| *m* | none | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | none | A QSE. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [NPRR1149: Replace Section 6.7.3 above with the following upon system implementation:]***6.7.3 Charges for a Failure to Provide Ancillary Service***(1) A charge to each QSE that fails to provide its Ancillary Service Supply Responsibility, whether or not a SASM is executed due to its failure to provide, is calculated by service for a given Operating Hour, as follows: (a) The total charge of failure on Ancillary Service Supply Responsibility for Reg-Up by QSE, if applicable:**RUFQAMTQSETOT *q* = RUFQAMT *q +*RRUFQAMT *q***Where:RUFQAMT *q* = Max(MCPCRU *m*, AVGRTASIP) \* (RUFQ *q*+TRUFQ *q*)RRUFQAMT *q* = MCPCRU *rs* \* RRUFQ *q,* *rs*AVGRTASIP = (RTRSVPOR *i* + RTRDP *i*) / 4Where for all Resources:TRUFQ *q* =Max ([(SARUQ *q* + RUTRSQ *q* + (RTPCRU *q, m*) + PCRU *q* + RUCRUQ *q*) – (RUTRPQ *q* + RUFQ *q* + RRUFQ *q, rs* + RUINFQ *q*)] – TELRUR *q, r*, 0)SARUQ *q* = DASARUQ *q* + RTSARUQ *q*The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| RUFQAMTQSETOT *q* | $ | *Reg-Up Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RRUFQAMT *q* | $ | *Reconfiguration Reg-Up Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RUFQAMT *q* | $ | *Reg-Up Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| MCPCRU *m* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Up by market—*The MCPC for Reg-Up in the market *m*, for the hour. |
| MCPCRU *rs* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Up by RSASM—*The MCPC for Reg-Up in the RSASM *rs*, for the hour. |
| RUFQ *q* | MW | *Reg-Up Failure Quantity per QSE—*QSE *q* total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RRUFQ *q, rs* | MW | *Reconfiguration Reg-Up Failure Quantity per QSE—*QSE *q* total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Up, for the hour. |
| RTRDP *i* | $/MWh | *Real-Time On-Line Reliability Deployment Price—*The Real-Time price for the 15-minute Settlement Interval *i*, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder. |
| RTRSVPOR *i* | $/MWh | *Real-Time Reserve Price for On-Line Reserves—*The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval *i*. |
| AVGRTASIP | $/MW per hour | *Average Real-Time Ancillary Service Imbalance Price—*The average of the sum of the Real-Time On-Line Reliability Deployment Price and the Real-Time Reserve Price for On-Line Reserves used in the calculation of Real-Time Ancillary Service Imbalance Amount per Section 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge, for the Operating Hour. |
| SARUQ *q* | MW | *Total Self-Arranged Reg-Up Quantity per QSE for all markets*—The sum of all self-arranged Reg-Up quantities submitted by QSE *q* for DAM and all SASMs. |
| RUTRSQ *q* | MW | *Reg-Up Trade Sale per QSE—*QSE *q*’s total time-weighted average capacity Trade Sale for Reg-Up, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RTPCRU *q, m* | MW | *Procured Capacity for Reg-Up by QSE by market—*The MW portion of QSE *q*’s Ancillary Service Offers cleared in the market *m* (SASM or RSASM) to provide Reg-Up, for the hour. |
| PCRU *q* | MW | *Procured Capacity for Reg-Up per QSE in DAM*—The total Reg-Up Service capacity quantity awarded to QSE *q* in the DAM for all the Resources represented by the QSE, for the hour. |
| RUCRUQ *q* | MW | *RUC-committed for Reg-Up per QSE—*The total quantity of Reg-Up Service committed by the RUC Process for Resources represented by QSE *q*, for the hour. |
| RUTRPQ *q* | MW | *Reg-Up Trade Purchases per QSE—*QSE *q*’s total time-weighted average capacity Trade Purchasefor Reg-Up, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RUINFQ *q* | MW | *Reg-Up Infeasible Quantity per QSE—*QSE *q*’s total capacity associated with infeasibleAncillary Service Supply Responsibilitiesfor Reg-Up, for the hour. |
| TELRUR *q, r* | MW | *Telemetered Reg-Up Responsibility for the Resource—*The time-weighted average telemetered Reg-Up Ancillary Service Resource Responsibility for the Resource *r*, represented by QSE *q*, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| DASARUQ *q* | MW | *Day-Ahead Self-Arranged Reg-Up Quantity per QSE*—The self-arranged Reg-Up quantity submitted by QSE *q* before 1000 in the Day-Ahead. |
| RTSARUQ *q* | MW | *Self-Arranged Reg-Up Quantity per QSE for all SASMs*—The sum of all self-arranged Reg-Up quantities submitted by QSE *q* for all SASMs due to an increase in the Ancillary Service Plan per Section 4.4.7.1, Self-Arranged Ancillary Service Quantities. |
| TRUFQ *q* | MW | *Telemetered Reg-Up Failure Quantity per QSE—*Calculated failure quantity for QSE *q* by comparing its average telemetered Reg-Up Responsibility sum to its Ancillary Service Supply Responsibility for Reg-Up as calculated per paragraph (1) of Section 4.4.7.4, Ancillary Service Supply Responsibility, for the hour. |
| *i* | None | A 15-minute Settlement Interval within the Operating Hour. |
| *rs* | None | The RSASM for the given Operating Hour. |
| *m* | None | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | None | A QSE. |
| *r* | None | A Resource that is qualified to provide Reg-Up. |

(b) The total charge of failure on Ancillary Service Supply Responsibility for Reg-Down by QSE, if applicable:**RDFQAMTQSETOT *q* = RDFQAMT *q +*RRDFQAMT *q***Where:RDFQAMT *q* = Max (MCPCRD *m*, AVGRTASIP) \* (RDFQ *q* + TRDFQ *q*)RRDFQAMT *q* = MCPCRD *rs* \* RRDFQ *q,* *rs*AVGRTASIP = (RTRSVPOR *i* + RTRDP *i*) / 4Where for all Resources:TRDFQ *q* =Max ([(SARDQ *q* + RDTRSQ *q* + (RTPCRD *q, m*) + PCRD *q* + RUCRDQ *q*) – (RDTRPQ *q* + RDFQ *q* + RRDFQ *q* + RDINFQ *q*)] –  TELRDR *q, r*, 0)SARDQ *q* = DASARDQ *q* + RTSARDQ *q*The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| RDFQAMTQSETOT *q* | $ | *Reg-Down Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RRDFQAMT *q* | $ | *Reconfiguration Reg-Down Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RDFQAMT *q* | $ | *Reg-Down Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| MCPCRD *m* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Down by market—*The MCPC for Reg-Down in the market *m*, for the hour. |
| MCPCRD *rs* | $/MW per hour | *Market Clearing Price for Capacity for Reg-Down by RSASM—*The MCPC for Reg-Down in the RSASM *rs*, for the hour. |
| RDFQ *q* | MW | *Reg-Down Failure Quantity per QSE*—QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RRDFQ *q, rs* | MW | *Reconfiguration Reg-Down Failure Quantity per QSE*—QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Reg-Down, for the hour. |
| RTRDP *i* | $/MWh | *Real-Time On-Line Reliability Deployment Price—*The Real-Time price for the 15-minute Settlement Interval *i*, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder. |
| RTRSVPOR *i* | $/MWh | *Real-Time Reserve Price for On-Line Reserves—*The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval *i*. |
| AVGRTASIP | $/MW per hour | *Average Real-Time Ancillary Service Imbalance Price*—The average of the sum of the Real-Time On-Line Reliability Deployment Price and the Real-Time Reserve Price for On-Line Reserves used in the calculation of Real-Time Ancillary Service Imbalance Amount per Section 6.7.5 for the Operating Hour. |
| SARDQ *q* | MW | *Total Self-Arranged Reg-Down Quantity per QSE for all markets*—The sum of all self-arranged Reg-Down quantities submitted by QSE *q* for DAM and all SASMs. |
| RDTRSQ *q* | MW | *Reg-Down Trade Sale per QSE*—QSE *q*’s total time-weighted average capacity Trade Sale for Reg-Down, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RTPCRD *q, m* | MW | *Procured Capacity for Reg-Down by QSE by market—*The MW portion of QSE *q*’s Ancillary Service Offers cleared in the market *m* (SASM or RSASM) to provide Reg-Down, for the hour. |
| PCRD *q* | MW | *Procured Capacity for Reg-Down per QSE in DAM*—The total Reg-Down capacity quantity awarded to QSE *q* in the DAM for all the Resources represented by the QSE, for the hour. |
| RUCRDQ *q* | MW | *RUC-committed for Reg-Down per QSE*—The total quantity of Reg-Down committed by the RUC Process for Resources represented by QSE *q*, for the hour. |
| RDTRPQ *q* | MW | *Reg-Down Trade Purchases per QSE*—QSE *q*’s total time-weighted average capacity Trade Purchasefor Reg-Down, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RDINFQ *q* | MW | *Reg-Down Infeasible Quantity per QSE—*QSE *q*’s total capacity associated with infeasibleAncillary Service Supply Responsibilitiesfor Reg-Down, for the hour. |
| TELRDR *q, r* | MW | *Telemetered Reg-Down Responsibility for the Resource*—The time-weighted average telemetered Reg-Down Ancillary Service Resource Responsibility for the Resource *r* that is qualified to provide Reg-Down Ancillary Service, represented by QSE *q,* for the hour. The time-weighted average value is rounded to 0.1 MW. |
| DASARDQ *q* | MW | *Day-Ahead Self-Arranged Reg-Down Quantity per QSE*—The self-arranged Reg-Down quantity submitted by QSE *q* before 1000 in the Day-Ahead. |
| RTSARDQ *q* | MW | *Self-Arranged Reg-Down Quantity per QSE for all SASMs*—The sum of all self-arranged Reg-Down quantities submitted by QSE *q* for all SASMs due to an increase in the Ancillary Service Plan per Section 4.4.7.1. |
| TRDFQ *q* | MW | *Telemetered Reg-Down Failure Quantity per QSE—*Calculated failure quantity for QSE *q* by comparing its average telemetered Reg-Down Responsibility sum to its Ancillary Service Supply Responsibility for Reg-Down as calculated per paragraph (1) of Section 4.4.7.4, for the hour. |
| *i* | None | A 15-minute Settlement Interval within the Operating Hour. |
| *rs* | None | The RSASM for the given Operating Hour. |
| *m* | None | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | None | A QSE. |
| *r* | None | A Resource that is qualified to provide Reg-Down. |

(c) The total charge of failure on Ancillary Service Supply Responsibility for RRS by QSE, if applicable:**RRFQAMTQSETOT *q* = RRFQAMT *q +*RRRFQAMT *q***Where:RRFQAMT *q* = Max(MCPCRR *m*, AVGRTASIP) \* (RRFQ *q* + TRRFQ *q*)RRRFQAMT *q* = MCPCRR *rs* \* RRRFQ *q,* *rs*AVGRTASIP = (RTRSVPOR *i* + RTRDP *i*) / 4 Where for all Resources:TRRFQ *q =* Max([(SARRQ *q* + RRTRSQ *q* + (RTPCRR *q, m*) + PCRR *q* + RUCRRQ *q*) – (RRTRPQ *q* + RRFQ *q* + RRRFQ *q* + RRINFQ *q*)] –  TELRRSRC *q, r*, 0)Where for Load Resources, other than Controllable Load Resources, during an RRS deployment event:TELRRSRC *q, r* =Min (NPF *q, r* – LPC *q, r*, TELRRSR *q, r*) where NPF *q, r* and LPC *q, r* are derived from respective snapshots taken immediately prior to the time of deployment which will be used from deployment until 180 minutes after recall or if the time between a recall of Load Resources and a redeployment is less than 180 minutes, the snapshot to be used for NPF *q, r* and LPC *q, r* will be the time of the first deploymentWhere for Load Resources, other than Controllable Load Resources, prior to an RRS deployment event:TELRRSRC *q, r* =Min (NPF *q, r* – LPC *q, r*, TELRRSR *q, r*) SARRQ *q* = DASARRQ *q* + RTSARRQ *q*The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| RRFQAMTQSETOT *q* | $ | *Responsive Reserve Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RRRFQAMT *q* | $ | *Reconfiguration Responsive Reserve Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RRFQAMT *q* | $ | *Responsive Reserve Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| MCPCRR *m* | $/MW per hour | *Market Clearing Price for Capacity for Responsive Reserve per market—*The MCPC for RRS in the market *m*, for the hour. |
| MCPCRR *rs* | $/MW per hour | *Market Clearing Price for Capacity for Responsive Reserve per RSASM—*The MCPC for RRS in the RSASM *rs*, for the hour. |
| RRFQ *q* | MW | *Responsive Reserve Failure Quantity per QSE*—QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RRRFQ *q, rs* | MW | *Reconfiguration Responsive Reserve Failure Quantity per QSE—*QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for RRS, for the hour. |
| RTRDP *i* | $/MWh | *Real-Time On-Line Reliability Deployment Price—*The Real-Time price for the 15-minute Settlement Interval *i*, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder. |
| RTRSVPOR *i* | $/MWh | *Real-Time Reserve Price for On-Line Reserves—*The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval *i*. |
| AVGRTASIP | $/MW per hour | *Average Real-Time Ancillary Service Imbalance Price*—The average of the sum of the Real-Time On-Line Reliability Deployment Price and the Real-Time Reserve Price for On-Line Reserves used in the calculation of Real-Time Ancillary Service Imbalance Amount per Section 6.7.5 for the Operating Hour. |
| SARRQ *q* | MW | *Total Self-Arranged Responsive Reserve Quantity per QSE for all markets*—The sum of all self-arranged RRS quantities submitted by QSE *q* for DAM and all SASMs. |
| RRTRSQ *q* | MW | *Responsive Reserve Trade Sale per QSE*—QSE *q*’s total time-weighted average capacity Trade Sale for RRS, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RTPCRR *q, m* | MW | *Procured Capacity for Responsive Reserve per QSE by market—*The MW portion of QSE *q*’s Ancillary Service Offers cleared in the market *m* (SASM or RSASM) to provide RRS, for the hour. |
| PCRR *q* | MW | *Procured Capacity for Responsive Reserve per QSE in DAM*—The total RRS capacity quantity awarded to QSE *q* in the DAM for all the Resources represented by the QSE, for the hour. |
| RUCRRQ *q* | MW | *RUC-committed for Responsive Reserve per QSE*—The total quantity of RRS committed by the RUC Process for Resources represented by QSE *q*, for the hour. |
| RRTRPQ *q* | MW | *Responsive Reserve Trade Purchases per QSE*—QSE *q*’s total time-weighted average capacity Trade Purchasefor RRS, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RRINFQ *q* | MW | *Responsive Reserve Infeasible Quantity per QSE—*QSE *q*’s total capacity associated with infeasibleAncillary Service Supply Responsibilitiesfor RRS, for the hour. |
| TELRRSR *q, r* | MW | *Telemetered Responsive Reserve Responsibility for the Resource*—The average time-weighted telemetered RRS Ancillary Service Resource Responsibility for the Resource *r*, represented by the QSE *q,* for the hour. The time-weighted average value is rounded to 0.1 MW. |
| TELRRSRC *q, r* | MW | *Telemetered Responsive Reserve Responsibility for the Resource as Calculated*—The calculated comparison of the time-weighted average telemetered RRS Ancillary Service Resource Responsibility as compared to available capacity for the Resource *r*, represented by the QSE *q,* for the hour. |
| NPF *q, r* | MW | *Non-Controllable Load Resource Net Power Consumption for the QSE*—The average NPF from Load Resource other than Controllable Load Resources *r*, represented by QSE *q,* for the hour. |
| LPC *q, r* | MW | *Non-Controllable Load Resource Low Power Consumption for the QSE*—The average Low Power Consumption (LPC) from Load Resource other than Controllable Load Resources *r*, represented by QSE *q,* for the hour. |
| DASARRQ *q* | MW | *Day-Ahead Self-Arranged Responsive Reserve Quantity per QSE*—The self-arranged RRS quantity submitted by QSE *q* before 1000 in the Day-Ahead. |
| RTSARRQ *q* | MW | *Self-Arranged Responsive Reserve Quantity per QSE for all SASMs*—The sum of all self-arranged RRS quantities submitted by QSE *q* for all SASMs due to an increase in the Ancillary Service Plan per Section 4.4.7.1. |
| TRRFQ *q* | MW | *Telemetered Responsive Reserve Failure Quantity per QSE—*Calculated failure quantity for QSE *q* by comparing its average telemetered Responsive Reserve Responsibility sum to its Ancillary Service Supply Responsibility for RRS as calculated per paragraph (1) of Section 4.4.7.4, for the hour. |
| *i* | None | A 15-minute Settlement Interval within the Operating Hour. |
| *rs* | None | The RSASM for the given Operating Hour. |
| *m* | None | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | None | A QSE. |
| *r* | None | A Resource that is qualified to provide RRS. |

(d) The total charge of failure on Ancillary Service Supply Responsibility for Non-Spin by QSE, if applicable:**NSFQAMTQSETOT *q* = NSFQAMT *q +*RNSFQAMT *q***Where:NSFQAMT *q* = Max (MCPCNS *m*, AVGRTASIP) \* (NSFQ *q* + TNSFQ *q*)RNSFQAMT *q* = MCPCNS *rs* \* RNSFQ *q,* *rs*AVGRTASIP = (RTRSVPOR *i* + RTRDP *i*) / 4 Where for all Resources:TNSFQ *q =* Max([(SANSQ *q* + NSTRSQ *q* + (RTPCNS *q, m*) + PCNS *q* + RUCNSQ *q*) – (NSTRPQ *q* + NSFQ *q* + RNSFQ *q* + NSINFQ *q*)] –TELNSRC *q, r*, 0)Where for Load Resources, other than Controllable Load Resources, during a Non-Spin deployment event:TELNSRC *q, r* = Min(NPF *q, r* – LPC *q, r*, TELNSR *q, r*) where NPF *q, r* and LPC *q, r* are derived from respective snapshots taken immediately prior to the time of deployment which will be used from deployment until 180 minutes after recall or if the time between a recall of Load Resources and a redeployment is less than 180 minutes, the snapshot to be used for NPF *q, r* and LPC *q, r* will be the time of the first deploymentWhere for Load Resources, other than Controllable Load Resources, prior to a Non-Spin deployment event:TELNSRC *q, r* = Min(NPF *q, r* – LPC *q, r*, TELNSR *q, r*) SANSQ *q* = DASANSQ *q* + RTSANSQ *q*The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| NSFQAMTQSETOT *q* | $ | *Non-Spin Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| RNSFQAMT *q* | $ | *Reconfiguration Non-Spin Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| NSFQAMT *q* | $ | *Non-Spin Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| MCPCNS *m* | $/MW per hour | *Market Clearing Price for Capacity for Non-Spin by market—*The MCPC for Non-Spin in the market *m*, for the hour. |
| MCPCNS *rs* | $/MW per hour | *Market Clearing Price for Capacity for Non-Spin by RSASM—*The MCPC for Non-Spin in the RSASM *rs*, for the hour. |
| NSFQ *q* | MW | *Non-Spin Failure Quantity per QSE—*QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| RNSFQ *q, rs* | MW | *Reconfiguration Non-Spin Failure Quantity per QSE—*QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for Non-Spin, for the hour. |
| RTRDP *i* | $/MWh | *Real-Time On-Line Reliability Deployment Price—*The Real-Time price for the 15-minute Settlement Interval *i*, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder. |
| RTRSVPOR *i* | $/MWh | *Real-Time Reserve Price for On-Line Reserves—*The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval *i*. |
| AVGRTASIP | $/MW per hour | *Average Real-Time Ancillary Service Imbalance Price*—The average of the sum of the Real-Time On-Line Reliability Deployment Price and the Real-Time Reserve Price for On-Line Reserves used in the calculation of Real-Time Ancillary Service Imbalance Amount per Section 6.7.5 for the Operating Hour. |
| SANSQ *q* | MW | *Total Self-Arranged Non-Spin Quantity per QSE for all markets*—The sum of all self-arranged Non-Spin quantities submitted by QSE *q* for DAM and all SASMs. |
| NSTRSQ *q* | MW | *Non-Spinning Reserve Trade Sale per QSE*—QSE *q*’s total time-weighted average capacity Trade Sale for Non-Spin, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RTPCNS *q, m* | MW | *Procured Capacity for Non-Spin Reserve per QSE by market—*The MW portion of QSE *q*’s Ancillary Service Offers cleared in the market *m* (SASM or RSASM) to provide Non-Spin, for the hour. |
| PCNS *q* | MW | *Procured Capacity for Non-Spin Reserve per QSE in DAM*—The total Non-Spin capacity quantity awarded to QSE *q* in the DAM for all the Resources represented by the QSE, for the hour. |
| RUCNSQ *q* | MW | *RUC-committed for Non-Spin Reserve per QSE*—The total quantity of Non-Spin committed by the RUC Process for Resources represented by QSE *q*, for the hour. |
| NSTRPQ *q* | MW | *Non-Spin Reserve Trade Purchases per QSE*—QSE *q*’s total time-weighted average capacity Trade Purchasefor Non-Spin, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| NSINFQ *q* | MW | *Non-Spin Reserve Infeasible Quantity per QSE—*QSE *q*’s total capacity associated with infeasibleAncillary Service Supply Responsibilitiesfor Non-Spin, for the hour. |
| TELNSR *q, r* | MW | *Telemetered Non-Spin Reserve Responsibility for the Resource*—The time-weighted average telemetered Non-Spin Ancillary Service Resource Responsibility for the Resource, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| TELNSRC *q, r* | MW | *Telemetered Non-Spin Reserve Responsibility for the Resource as Calculated*—The time-weighted average calculated telemetered Non-Spin Ancillary Service Resource Responsibility as compared to available capacity for the Resource, for the hour. |
| NPF *q, r* | MW | *Non-Controllable Load Resource Net Power Consumption for the QSE*—The average NPF from Load Resource other than Controllable Load Resources *r*, represented by QSE *q,* for the hour. |
| LPC *q, r* | MW | *Non-Controllable Load Resource Low Power Consumption for the QSE*—The average LPC from Load Resource other than Controllable Load Resources *r*, represented by QSE *q,* for the hour. |
| DASANSQ *q* | MW | *Day-Ahead Self-Arranged Non-Spin Reserve Quantity per QSE*—The self-arranged Non-Spin quantity submitted by QSE *q* before 1000 in the Day-Ahead. |
| RTSANSQ *q* | MW | *Self-Arranged Non-Spinning Reserve Quantity per QSE for all SASMs*—The sum of all self-arranged Non-Spin quantities submitted by QSE *q* for all SASMs due to an increase in the Ancillary Service Plan per Section 4.4.7.1. |
|  |  |  |
| TNSFQ *q* | MW | *Telemetered Non-Spin Failure Quantity per QSE—*Calculated failure quantity for QSE *q* by comparing its average telemetered Non-Spin Responsibility to its Ancillary Service Supply Responsibility for Non-Spin as calculated per paragraph (1) of Section 4.4.7.4, for the hour. |
| *i* | None | A 15-minute Settlement Interval within the Operating Hour. |
| *rs* | None | The RSASM for the given Operating Hour. |
| *m* | None | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | None | A QSE. |
| *r* | None | A Resource that is qualified to provide Non-Spin. |

(e) The total charge of failure on Ancillary Service Supply Responsibility for ECRS by QSE, if applicable:**ECRFQAMTQSETOT *q* = ECRFQAMT *q +*RECRFQAMT *q***Where:ECRFQAMT *q* = Max(MCPCECR *m*, AVGRTASIP) \* (ECRFQ *q* + TECRFQ *q*)RECRFQAMT *q* = MCPCECR *rs* \* RECRFQ *q,* *rs*AVGRTASIP = (RTRSVPOR *i* + RTRDP *i*) / 4 Where for all Resources:TECRFQ *q =* Max ([(SAECRQ *q* + ECRTRSQ *q* +  (RTPCECR *q, m*) + PCECR *q* + RUCECRQ *q*) – (ECRTRPQ *q* + ECRFQ *q* + RECRFQ *q* + ECRINFQ *q*)] – TELECRRC *q, r*, 0)Where for Load Resources, other than Controllable Load Resources, during an ECRS deployment event:TELECRRC *q, r =* Min(Max(NPF *q, r* – LPC *q, r* – TELRRSR *q, r*, 0), TELECRR *q, r*) where NPF *q, r* and LPC *q, r* are derived from respective snapshots taken immediately prior to the time of deployment which will be used from deployment until 180 minutes after recall or if the time between a recall of Load Resources and a redeployment is less than 180 minutes, the snapshot to be used for NPF *q, r* and LPC *q, r* will be the time of the first deploymentWhere for Load Resources, other than Controllable Load Resources, prior to an ECRS deployment event:TELECRRC *q, r =* Min(Max(NPF *q, r* – LPC *q, r* – TELRRSR *q, r*, 0), TELECRR *q, r*)SAECRQ *q* = DASAECRQ *q* + RTSAECRQ *q*The above variables are defined as follows:

|  |  |  |
| --- | --- | --- |
| **Variable** | **Unit** | **Description** |
| ECRFQAMTQSETOT *q* | $ | *ERCOT Contingency Reserve Service Failure Quantity Amount per QSE*—The total charge to QSE *q* for its total capacity associated with failures and reconfiguration reductions on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| RECRFQAMT *q* | $ | *Reconfiguration ERCOT Contingency Reserve Service Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| ECRFQAMT *q* | $ | *ERCOT Contingency Reserve Service Failure Quantity Amount per QSE*—The charge to QSE *q* for its total capacity associated with failures on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| RTRDP *i* | $/MWh | *Real-Time On-Line Reliability Deployment Price—*The Real-Time price for the 15-minute Settlement Interval *i*, reflecting the impact of reliability deployments on energy prices that is calculated from the Real-Time On-Line Reliability Deployment Price Adder. |
| RTRSVPOR *i* | $/MWh |

|  |
| --- |
| *Real-Time Reserve Price for On-Line Reserves—*The Real-Time Reserve Price for On-Line Reserves for the 15-minute Settlement Interval *i*.  |

 |
| AVGRTASIP | $/MW per hour | *Average Real-Time Ancillary Service Imbalance Price*—The average of the sum of the Real-Time On-Line Reliability Deployment Price and the Real-Time Reserve Price for On-Line Reserves used in the calculation of Real-Time Ancillary Service Imbalance Amount per Section 6.7.5 for the Operating Hour. |
| SAECRQ *q* | MW | *Total Self-Arranged ERCOT Contingency Reserve Service Quantity per QSE for all markets—*The sum of all self-arranged ECRS quantities submitted by QSE *q* for DAM and all SASMs. |
| ECRTRSQ *q* | MW | *ERCOT Contingency Reserve Service Trade Sale per QSE*—QSE *q’s* total time-weighted average capacity Trade Sale for ECRS, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| RTPCECR *q, m* | MW | *Procured Capacity for ERCOT Contingency Reserve Service per QSE by market*—The MW portion of QSE *q’s* Ancillary Service Offers cleared in the market *m* (SASM or RSASM) to provide ECRS, for the hour. |
| PCECR *q* | MW | *Procured Capacity for ERCOT Contingency Reserve Service per QSE in DAM—*The total ECRS capacity quantity awarded to QSE *q* in the DAM for all the Resources represented by the QSE, for the hour. |
| RUCECRQ *q* | MW | *RUC-committed for ERCOT Contingency Reserve Service per QSE*—The total quantity of ECRS committed by the RUC Process for Resources represented by QSE *q*, for the hour. |
| ECRTRPQ *q* | MW | *ERCOT Contingency Reserve Service Trade Purchases per QSE*—QSE *q’s* total time-weighted average capacity Trade Purchase for ECRS, for the hour. The time-weighted average value is rounded to 0.1 MW. |
| ECRINFQ *q* | MW | *ERCOT Contingency Reserve Service Infeasible Quantity per QSE—*QSE *q’s* total capacity associated with infeasible Ancillary Service Supply Responsibilities for ECRS, for the hour. |
| TELECRR *q, r* | MW | *Telemetered ERCOT Contingency Reserve Service Responsibility for the Resource*—The time-weighted average telemetered ECRS Ancillary Service Resource Responsibility for the Resource *r*, represented by QSE *q,* for the hour. The time-weighted average value is rounded to 0.1 MW. |
| TELECRRC *q, r* | MW | *Telemetered ERCOT Contingency Reserve Service Responsibility for the Resource as Calculated*—The time-weighted average telemetered ECRS Ancillary Service Resource Responsibility as compared to available capacity for the Resource *r*, represented by QSE *q,* for the hour. |
| NPF *q, r* | MW | *Non-Controllable Load Resource Net Power Consumption for the QSE*—The average NPF from Load Resource other than Controllable Load Resources *r*, represented by QSE *q,* for the hour. |
| LPC *q, r* | MW | *Non-Controllable Load Resource Low Power Consumption for the QSE*—The average LPC from Load Resource other than Controllable Load Resources *r*, represented by QSE *q,* for the hour. |
| DASAECRQ *q* | MW | *Day-Ahead Self-Arranged ERCOT Contingency Reserve Service Quantity per QSE*—The self-arranged ECRS quantity submitted by QSE *q* before 1000 in the Day-Ahead. |
| RTSAECRQ *q* | MW | *Self-Arranged ERCOT Contingency Reserve Service Quantity per QSE for all SASMs*—The sum of all self-arranged ECRS quantities submitted by QSE *q* for all SASMs due to an increase in the Ancillary Service Plan per Section 4.4.7.1. |
| MCPCECR *m* | $/MW per hour | *Market Clearing Price for Capacity for ERCOT Contingency Reserve Service per market—*The MCPC for ECRS in the market *m*, for the hour. |
| MCPCECR *rs* | $/MW per hour | *Market Clearing Price for Capacity for ERCOT Contingency Reserve Service per RSASM—*The MCPC for ECRS in the RSASM *rs*, for the hour. |
| ECRFQ *q* | MW | *ERCOT Contingency Reserve Service Failure Quantity per QSE—*QSE *q*’s total capacity associated with failures on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| RECRFQ *q, rs* | MW | *Reconfiguration ERCOT Contingency Reserve Service Failure Quantity per QSE—*QSE *q*’s total capacity associated with reconfiguration reductions on its Ancillary Service Supply Responsibility for ECRS, for the hour. |
| TELRRSR *q, r* | MW | *Telemetered Responsive Reserve Responsibility for the Resource*—The average time-weighted telemetered RRS Ancillary Service Resource Responsibility for the Resource *r*, represented by the QSE *q,* for the hour. The time-weighted average value is rounded to 0.1 MW. |
| TECRFQ *q* | MW | *Telemetered ERCOT Contingency Reserve Service Failure Quantity per QSE—*Calculated failure quantity for QSE *q* by comparing its average telemetered ECRS Responsibility to its Ancillary Service Supply Responsibility for ECRS as calculated per paragraph (1) of Section 4.4.7.4, for the hour. |
| *i* | none | A 15-minute Settlement Interval within the Operating Hour. |
| *rs* | none | The RSASM for the given Operating Hour. |
| *m* | none | The DAM, SASM, or RSASM for the given Operating Hour. |
| *q* | none | A QSE. |
| *r* | none | A Resource that is qualified to provide ECRS. |

 |

|  |
| --- |
| [NPRR1010: Delete Section 6.7.3 above upon system implementation of the Real-Time Co-Optimization (RTC) project.] |