RTC+B Settlement Overview

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Settlement Overview

- This presentation covers a high-level overview of the Settlement changes under Real-Time Co-optimization and Single Model ESR.

- List of NPRRs included in RTC+B Project:
  - NPRR1007-1013 – RTC
  - NPRR1014 – Single Model ESR
  - NPRR1029 – Only Sections 25.5.2, 25.5.5, 25.5.6 for Market Suspension for ESRs
  - NPRR963 – Sections 6.6.5.5, 6.6.5.5.1, 6.6.5.6; NPRR1014 was written on top of the NPRR963 grey boxes for Set Point Deviation for ESRs – will need to keep as baseline for NPRR1014 implementation
  - NPRR1054 – Removes Oklaunion Exemption; Cleans up any remaining code and billing determinants in the Settlement System
  - NPRR1172 – Only Section 5.7.2 for RUC Clawback Settlement Clean up
  - NPRR1000 – Eliminate DSR
  - NPRR1236 – RUC State of Charge
  - NPRR1245 & 1246 – Clean-up NPRRs for RTC and ESR

Day-Ahead Make-Whole Payment

- Description of Change: Excludes ESRs from receiving DAMW payments

- Protocol Section 4.6.2.3 and 4.6.2.3.1

[NPRR1014: Insert paragraph (7) below upon system implementation:]

(7)   An Energy Storage Resource (ESR) is not eligible for Day-Ahead Make-Whole Payment.

Day-Ahead Ancillary Service Payment (new)

- Description of Change: Adding Ancillary Service Only Offers in DAM; new charge type on DAM Settlement Statement

- Protocol Section 4.6.4.1, Payments for Ancillary Services Procured in the DAM

- Settlement below is for Reg-Up. Same Settlement changes for each AS type.

(2) ERCOT shall pay each QSE whose Ancillary Service Only Offers to provide Reg-Up to ERCOT were cleared in the DAM, for each hour as follows:

$$DAPCRUOAMT_q = (-1) * MCPCRU_{DAM} * DARUOAWD_q$$

Day-Ahead Ancillary Service Charge

- Description of Change: Adding Ancillary Service Only Offers in DAM

- Protocol Section 4.6.4.2, Charges for Ancillary Services Procured in the DAM

- Settlement below is for Reg-Up. Same Settlement changes for each AS type.

[NPRR1008: Replace paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

(1)   Each QSE shall pay to ERCOT or be paid by ERCOT a Reg-Up Service charge for each hour as follows:

$$DARUAMT_q = DARUPR * DARUQ_q$$

Where:

$$DARUPR = (-1) * DAPCRUAMTTOT / DARUQTOT$$

$$DAPCRUAMTTOT = \sum_q (PCRUAMT_q + DAPCRUOAMT_q)$$

$$DARUQTOT = \sum_q DARUQ_q$$

$$DARUQ_q = DARUO_q - DASARUQ_q$$

Day-Ahead Congestion Revenue Rights

- Description of Change: For minimum and maximum prices used for the source and sink settlement points, adding a new category for "ESR"

- Protocol Section 7.9.1.3, Minimum and Maximum Resource Prices

> *[NPRR1014: Replace paragraph (1) above with the following upon system implementation:]*
>
> (1)   For purposes of Section 7.9.1, Day-Ahead CRR Payments and Charges, Settlements data published to the Market Information System (MIS) Secure Area shall include the association of the Resource Category for each Generation Resource and Energy Storage Resource (ESR). The following prices specified in paragraphs (2) and (3) below are used in the CRR hedge value calculation for CRRs settled in the DAM.

- Minimum Price (MINRESPR):

> *[NPRR1014: Insert item (o) below upon system implementation and renumber accordingly:]*
>
> (o)   ESR = -$20/MWh; and

- Maximum Price (MAXRESPR):

> *[NPRR1014: Insert item (o) below upon system implementation and renumber accordingly:]*
>
> (o)   ESR = $100/MWh; and

Energy Offer Curve Cost Caps

- Description of Change:
  - Changing the value of the cost categories "Other" and "RMR Resource"; Adding a new category for "Energy Storage Resource"
  - Values are utilized in the calculations of Day-Ahead Average Incremental Energy Cost (DAAIEC) and Real-Time Energy Offer Curve Cost Cap (RTEOCOST)
  - DAAIEC is utilized in DAM Make-Whole Payments; ESRs are excluded from DAAIEC
  - RTEOCOST is utilized in RUC Make-Whole Payments, HDLO Payments, and VSS Payments
- Protocol Section 4.4.9.3.3, Energy Offer Curve Cost Caps

> (l)   Other = SWCAP;
>
> *[NPRR1008: Replace item (l) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]*
>
> (l)   Other = DASWCAP or RTSWCAP;
>
> (m)   RMR Resource = SWCAP;
>
> *[NPRR1008: Replace item (m) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]*
>
> (m)   RMR Resource = effective Value of Lost Load (VOLL);
>
> (n)   Wind Generation Resources = $0.00/MWh; ~~and~~
>
> (o)   PhotoVoltaic Generation Resource (PVGR) = $0.00/MWh~~.~~; and
>
> (p)   Energy Storage Resource (ESR) = $0.00/MWh.

Real-Time HDLO Energy Payment

- Description of Change:
  - Remove Real-Time Reserve Price for On-Line Reserves (RTRSVPOR) from calculation
  - Clarify that an ESR will qualify for HDLO payment if they were directed to reduce power

- Protocol Section 6.6.3.6, Real-Time High Dispatch Limit Override Energy Payment

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

6.6.3.6   Real-Time High Dispatch Limit Override Energy Payment

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

The payment shall be calculated as follows:

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

Set-Point Deviation

- Description of Change:
  - Renames charge from Base-Point Deviation to Set-Point Deviation; will also rename charge type on RTM Settlement Statement
  - Renames AABP to AASP for all SPD calculations
  - Utilizes UDSP instead of BP + Regulation for AASP calculation
  - Adds a new SPD calculation for ESRs based on evaluation for over and under performance
  - Tolerance threshold set at 3% or 3MW
  - Removes exemption for Dynamically Scheduled Resources (NPRR1000)
- Protocol Section 6.6.5, Set Point Deviation Charge

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

6.6.5.1   Resource Set Point Deviation Charge

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

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

$$AASP_{q,r,p,i} = \sum_{y} (AVGSP5M_{q,r,p,i,y}) / 3$$

Set-Point Deviation (cont.)

- Protocol Section 6.6.5.5, Energy Storage Resource Set Point Deviation Charge for Over Performance (excludes any language related to DC-Coupled from NPRR1014; grey box edited below to show final blacklined language from NPRR1246)

6.6.5.5 Energy Storage Resource Set Point Deviation Charge for Over Performance

(1) ERCOT shall charge a QSE for an ESR a Set Point Deviation Charge for over-performance if the telemetered generation or consumption exceeds the specified tolerance.

(2) The tolerance is the greater of 3% of the AASP for the ESR in the Settlement Interval, or three MW above the AASP for the ESR in the Settlement Interval.

(3) The deviation charge for over-performance for each QSE for each ESR at each Resource Node Settlement Point will be calculated as follows:

$$SPDAMT_{q,r,p,i} = \text{Max}(PR3, RTSPP_{p,i}) * OPESR_{q,r,p,i}$$

Where:

$$OPESR_{q,r,p,i} = \text{Max}[0, (TWTG_{q,r,p,i} - \tfrac{1}{4} * \text{Max}[(AASP_{q,r,p,i} + ABS(K3* AASP_{q,r,p,i})), (AASP_{q,r,p,i} + Q3)])]$$

Where:

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

Set-Point Deviation (cont.)

- Protocol Section 6.6.5.5.1, Energy Storage Resource Set Point Deviation Charge for Under Performance (excludes any language related to DC-Coupled from NPRR1014 ; grey box edited below to show final blacklined language from NPRR1246)

6.6.5.5.1 Energy Storage Resource Set Point Deviation Charge for Under Performance

(1) ERCOT shall charge a QSE for an ESR a Set Point Deviation Charge for under-performance if the telemetered generation or consumption is below the specified tolerance.

(2) The tolerance is the lesser of 3% of the AASP for the ESR in the Settlement Interval, or three MW below the AASP for the ESR in the Settlement Interval.

(3) The deviation charge for under-performance for each QSE for each ESR at each Resource Node Settlement Point will be calculated as follows:

$$\text{SPDAMT}_{q,r,p,i} = (-1) * \text{Min}(\text{PR4}, \text{RTSPP}_{p,i}) * \text{Min}(1, \text{KP2}) * \text{UPESR}_{q,r,p,i}$$

Where:

$$\text{UPESR}_{q,r,p,i} = \text{Max}[0, \tfrac{1}{4} * \text{Min}[(\text{AASP}_{q,r,p,i} - \text{ABS}(\text{K4} * \text{AASP}_{q,r,p,i})), (\text{AASP}_{q,r,p,i} - \text{Q4})] - \text{TWTG}_{q,r,p,i}]$$

Where:

$$\text{TWTG}_{q,r,p,i} = (\textstyle\sum_{y}(\text{AVGTG5M}_{q,r,p,i,y})/3) * \tfrac{1}{4}$$

Set-Point Deviation (cont.)

- Protocol Section 6.6.5.3, Resources Exempt from Deviation Charges (changes from NPRR1000)

6.6.5.3   Resources Exempt from Deviation Charges

(1)   Resource Base Point Deviation Charges do not apply to the following:

    (a)   Reliability Must-Run (RMR) Units;

    (b)   ~~Dynamically Scheduled Resources (DSRs) (except as described in Section 6.4.2.2, Output Schedules for Dynamically Scheduled Resources);~~

    (b~~c~~)   Qualifying Facilities (QFs) that do not submit an Energy Offer Curve for the Settlement Interval;

    (c~~d~~)   Quick Start Generation Resources (QSGRs) during the 15-minute Settlement Interval after the start of the first SCED interval in which the QSGR is deployed; or

    (d~~e~~)   Settlement Intervals in which Emergency Base Points were issued to the Resource.

Voltage Support Service VAr Payment

- Description of Change:
  - Updates VSSVARAMT payment to include ESRs
  - New URLLAG and URLLEAD intermediate calculations for ESRs
- Protocol Section 6.6.7.1(1) and (2), Voltage Support Service Payments
- Note: As discussed, additional comments have been submitted to NPRR1246 to not compensate an ESR in the instance where an ESR is discharging but showing a negative HSL in their COP.

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

Where:

$$\text{VSSVARLAG}_{q,r} = \text{Max} \left[0, \text{Min} \left(\tfrac{1}{4} * \text{VSSVARIOL}_{q,r}, \text{RTVAR}_{q,r} \right) - \left(\tfrac{1}{4} * \text{URLLAG}_{q,r} \right) \right]$$

$$\text{VSSVARLEAD}_{q,r} = \text{Max} \left\{ 0, \left[\left(\tfrac{1}{4} * \text{URLLEAD}_{q,r} \right) - \text{Max} \left(\left(\tfrac{1}{4} * \text{VSSVARIOL}_{q,r} \right), \text{RTVAR}_{q,r} \right) \right] \right\}$$

And:

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

$$\text{URLLAG}_{q,r} = 0.32868 * \text{ABS}(\text{LSL}_{q,r})$$

$$\text{URLLEAD}_{q,r} = (-1) * 0.32868 * \text{ABS}(\text{LSL}_{q,r})$$

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

$$\text{URLLAG}_{q,r} = 0.32868 * \text{HSL}_{q,r}$$

$$\text{URLLEAD}_{q,r} = (-1) * 0.32868 * \text{HSL}_{q,r}$$

Voltage Support Service Lost Opportunity Payment

- Description of Change:
  - Updates VSSEAMT payment to include consideration of ESRs
  - New NETVSSA and RTCL intermediate calculations for ESRs
- Protocol Section 6.6.7.1(4), Voltage Support Service Payments

(4) The lost opportunity payment, if applicable:

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

$$VSSEAMT_{q,r} = (-1) * Max(0, RTSPP_p) * Max(0, (ABS(LSL_{q,r} * \frac{1}{4} - NETVSSA_{q,r})))$$

Otherwise:

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

Where:

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

For an ESR that is not a WSL:

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

And for an ESR that is a WSL:

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

Emergency Operations Payment

- Description of Change:
  - Updates EMREAMT payment to include consideration of ESRs
  - Adds a new EMREAMT calculation that will consider RTM AS revenues in addition to RTM energy revenues when calculating an emergency payment
  - Energy Offer Curve or Energy Bid/Offer Curve used in the calculation of the Emergency Base Point Price (EBPPR) will be the curve that was submitted and approved immediately prior to the emergency event, excludes price correction events
  - MOC used for ESRs will be set to the highest RTSPP at the Resource's Settlement Point for the Operating Day

- Protocol Section 6.6.9, Emergency Operations Settlement; 6.6.9.1, Payment for Emergency Operations Settlement

- To determine which calculation the Resource will be evaluated under, we will have a new flag, EMGSETLFLAG, that will indicate a value of 1 or 2:
  - If the Resource will be analyzed for payment under paragraphs (1) Real EBP, (2) Cap Test or (8) CFC Mode of 6.6.9, the EMGSETLFLAG will be set to 1 and settled under paragraph (1) of Section 6.6.9.1.
  - For all other scenarios, the EMGSETLFLAG will be set to 2 and settled under paragraph (2) of Section 6.6.9.1.

Emergency Operations Payment (cont.)

- Protocol Section 6.6.9.1 (1), Payment for Emergency Operations Settlement

- Same structure as current emergency payment is today, it has just been adjusted to account for the charging side of an ESR.

6.6.9.1   Payment for Emergency Operations Settlement

(1)   ERCOT shall pay the QSE additional compensation for the Resource at its Resource Node Settlement Point during the Settlement Intervals that qualify for emergency Settlement as described in Section 6.6.9, Emergency Operations Settlement. The payment for a given 15-minute Settlement Interval is calculated as follows:

$$EMREAMT_{q,r,p} = (-1) * (EMREPRGEN_{q,r,p} * EMREGEN_{q,r,p})$$
$$+ EMREPRLOAD_{q,r,p} * EMRELOAD_{q,r,p}$$

Where:

If any EBP > 0 then:

$$EMREPRGEN_{q,r,p} = Max\,(0,\, EBPWAPRGEN_{q,r,p} - RTSPP_p)$$

$$EBPWAPRGEN_{q,r,p} = \frac{\sum_y (EBPPR_{q,r,p,y} * Max\,(0.001,\, EBP_{q,r,p,y}) * TLMP_y)}{\sum_y (Max\,(0.001,\, EBP_{q,r,p,y}) * TLMP_y)}$$

$$EMREGEN_{q,r,p} = Max\,(0,\, Min\,(AEBPGEN_{q,r,p},\, RTMG_{q,r,p}) - ¼ * Max\,(0,\, BP_{q,r,p}))$$

$$AEBPGEN_{q,r,p} = \sum_y (Max\,(0,\, EBP_{q,r,p,y}) * TLMP_y / 3600)$$

If any EBP < 0 then:

$$EMREPRLOAD_{q,r,p} = Max\,(0,\, RTSPP_p - EBPWAPRLOAD_{q,r,p})$$

$$EBPWAPRLOAD_{q,r,p} = \frac{\sum_y (EBPPR_{q,r,p,y} * Min\,(-0.001,\, EBP_{q,r,p,y}) * TLMP_y)}{\sum_y (Min\,(-0.001,\, EBP_{q,r,p,y}) * TLMP_y)}$$

$$EMRELOAD_{q,r,p} = Min\,(0,\, Max\,(AEBPLOAD_{q,r,p},\, RTCL_{q,r,p}) - ¼ * Min\,(0,\, BP_{q,r,p}))$$

$$AEBPLOAD_{q,r,p} = \sum_y (Min\,(0,\, EBP_{q,r,p,y}) * TLMP_y / 3600)$$

Emergency Operations Payment (cont.)

- Protocol Section 6.6.9.1 (2), Payment for Emergency Operations Settlement

- Considers Energy and AS Revenues in the Emergency settlement calculation

(2) ERCOT shall pay the QSE additional compensation for the Resource at its Resource Node Settlement Point during the Settlement Intervals that qualify for emergency Settlement as described in Section 6.6.9, Emergency Operations Settlement. The payment for a given 15-minute Settlement Interval is calculated as follows:

$$EMREAMT_{q,r,p} = Min\,(0, RTENET_{q,r,p} + RTASNET_{q,r,p})$$

(a) Where the Real-Time Energy Net Revenue is calculated as follows:

$$RTENET_{q,r,p} = RTEREV_{q,r,p} - RTEREVT_{q,r,p}$$

Where:

$$RTEREV_{q,r,p} = RTSPP_{q,r,p} * (EMREGEN_{q,r,p} + EMRELOAD_{q,r,p})$$

$$RTEREVT_{q,r,p} = EBPWAPRGEN_{q,r,p} * EMREGEN_{q,r,p} + EBPWAPRLOAD_{q,r,p} * EMRELOAD_{q,r,p}$$

If any EBP > 0 then:

$$EBPWAPRGEN_{q,r,p} = \frac{\sum_y (EBPPR_{q,r,p,y} * Max\,(0.001, EBP_{q,r,p,y}) * TLMP_y)}{\sum_y (Max\,(0.001, EBP_{q,r,p,y}) * TLMP_y)}$$

$$EMREGEN_{q,r,p} = Max\,(0, Min\,(AEBPGEN_{q,r,p}, RTMG_{q,r,p}))$$

$$AEBPGEN_{q,r,p} = \sum_y (Max\,(0, EBP_{q,r,p,y}) * TLMP_y / 3600)$$

If any EBP < 0 then:

$$EBPWAPRLOAD_{q,r,p} = \frac{\sum_y (EBPPR_{q,r,p,y} * Min\,(-0.001, EBP_{q,r,p,y}) * TLMP_y)}{\sum_y (Min\,(-0.001, EBP_{q,r,p,y}) * TLMP_y)}$$

$$EMRELOAD_{q,r,p} = Min\,(0, Max\,(AEBPLOAD_{q,r,p}, RTCL_{q,r,p}))$$

$$AEBPLOAD_{q,r,p} = \sum_y (Min\,(0, EBP_{q,r,p,y}) * TLMP_y / 3600)$$

(b) Where the Real-Time Ancillary Services Net Revenue is calculated as follows:

$$RTASNET_{q,r} = RTRUNET_{q,r} + RTRDNET_{q,r} + RTNSNET_{q,r} + RTRRNET_{q,r} + RTECRNET_{q,r}$$

Where for Reg-Up:

$$RTRUNET_{q,r} = RTRUREV_{q,r} - (\tfrac{1}{4}) * RTRUREVT_{q,r,p}$$

$$RTRUREVT_{q,r,p} = RTRUWAPR_{q,r,p} * RTRUAWD_{q,r}$$

$$RTRUWAPR_{q,r,p} = \frac{\sum_y (RTRUOPR_{q,r,p,y} * Max\,(0.001, RTRUAWDS_{q,r,p,y}) * TLMP_y)}{\sum_y (Max\,(0.001, RTRUAWDS_{q,r,p,y}) * TLMP_y)}$$

Where for Reg-Down:

$$RTRDNET_{q,r} = RTRDREV_{q,r} - (\tfrac{1}{4}) * RTRDREVT_{q,r,p}$$

$$RTRDREVT_{q,r,p} = RTRDWAPR_{q,r,p} * RTRDAWD_{q,r}$$

$$RTRDWAPR_{q,r,p} = \frac{\sum_y (RTRDOPR_{q,r,p,y} * Max\,(0.001, RTRDAWDS_{q,r,p,y}) * TLMP_y)}{\sum_y (Max\,(0.001, RTRDAWDS_{q,r,p,y}) * TLMP_y)}$$

Where for RRS:

$$RTRRNET_{q,r} = RTRRREV_{q,r} - (\tfrac{1}{4}) * RTRRREVT_{q,r,p}$$

$$RTRRREVT_{q,r,p} = RTRRWAPR_{q,r,p} * RTRRAWD_{q,r}$$

$$RTRRWAPR_{q,r,p} = \frac{\sum_y (RTRROPR_{q,r,p,y} * Max\,(0.001, RTRRAWDS_{q,r,p,y}) * TLMP_y)}{\sum_y (Max\,(0.001, RTRRAWDS_{q,r,p,y}) * TLMP_y)}$$

Switchable Generation Make-Whole Payment

- Description of Change: Updates the calculation of Switchable RT revenues to include RT AS Revenues

- Protocol Section 6.6.12.1, Switchable Generation Make-Whole Payment

[NPRR1010 and NPRR1014: Replace applicable portions of paragraph (1) above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010; or upon system implementation for NPRR1014:]

(1) To compensate QSEs representing SWGRs that switch to the ERCOT Control Area from a non-ERCOT Control Area pursuant to an ERCOT RUC instruction for an actual or anticipated EEA condition, ERCOT shall calculate a Switchable Generation Make-Whole Payment (SWMWAMT) for an Operating Day, allocated to each instructed Operating Hour as follows:

$$\text{SWMWAMT}_{q,r} = (-1) * \text{Max} (0, (\text{SWCG}_{q,r,d} - \text{SWRTREV}_{q,r,d})) / \text{SWIHR}_{q,r,d}$$

Where:

$$\text{SWCG}_{q,r,d} = \text{SWSUC}_{q,r,d} + \text{SWMEC}_{q,r,d} + \text{SWOC}_{q,r,d} + \text{SWAC}_{q,r,d} + \text{SWPSLR}_{q,r,d}$$

$$\text{SWRTREV}_{q,r,d} = \text{Max} [0, \sum_i (\text{RTSPP}_{p,i} * \text{RTMG}_{q,r,i} + (-1) * (\text{EMREAMT}_{q,r,p,i} + \text{VSSVARAMT}_{q,r,i} + \text{VSSEAMT}_{q,r,i}) + \text{RTRUREV}_{q,r,i} + \text{RTRDREV}_{q,r,i} + \text{RTRRREV}_{q,r,i} + \text{RTNSREV}_{q,r,i} + \text{RTECRREV}_{q,r,i})]$$

$$\text{SWAC}_{q,r,d} = \text{SWFC}_{q,r,d} + \text{SWEIC}_{q,r,d} + \text{SWASIC}_{q,r,d} + \text{SWMWDC}_{q,r,d} + \text{SWFIPC}_{q,r,d}$$

$$\text{SWPSLR}_{q,r,d} = \sum_i (\text{RTSPP}_{p,i} * \text{RTLPX}_{q,r,i}) - (\text{FIP+FA}) * \text{SFC}_d$$

If ERCOT has approved verifiable costs for the SWGR:

Real-Time Settlement for updated DAM AS Obligations (new)

- Description of Change: AS Obligations assigned in DAM will be recalculated based on the QSE's updated Hourly Load Ratio Share (HLRS); new charge type on RTM Settlement Statement

- Protocol Section 6.7.4, Real-Time Settlement for Updated Day-Ahead Market Ancillary Service Obligations

- Settlement below is for Reg-Up. Same Settlement changes for each AS type.

[NPRR1010: Replace Section 6.7.4 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.7.4 Real-Time Settlement for Updated Day-Ahead Market Ancillary Service Obligations

(1) Each QSE is charged or paid for net obligations for each Ancillary Service procured in the DAM. DAM costs are calculated for each QSE in accordance with Section 4.6.4, Settlement of Ancillary Services Procured in the DAM. DAM net total costs for Ancillary Service procured in the DAM are re-calculated for each QSE under this Section based on Real-Time Load Ratio Share (LRS). Payments and/or charges for Ancillary Service obligations are calculated by Operating Hour as follows:

(a) For Regulation Up Service (Reg-Up), if applicable:

$$DARTPCRUAMT_q = (DARUNOBL_q - DASARUQ_q) * DARUPR - DARUAMT_q$$

Where:

$$DARUNOBL_q = DAPCRUQTOT * HLRS_q$$

$$DAPCRUQTOT = \sum_q \left(\sum_r PCRUR_{r,q,DAM} + DARUOAWD_q + DASARUQ_q \right)$$

Real-Time Ancillary Service Settlement (new)

- Description of Change:
  - New payment or charge based on calculated AS Imbalance quantities
  - New charge for AS Only Offers purchased in DAM
  - New charge for AS Trade Overages
  - New load allocated settlement for the total AS payments and charges
  - New charge types on RTM Settlement Statement – 1 for each bullet above for each AS Type; total of 20 new charge types

- Protocol Section 6.7.5, Real-Time Ancillary Service Charges and Payments (includes all subsections) and 6.7.6, Real-Time Ancillary Service Revenue Neutrality Allocation

- Settlement on following slide is for Reg-Up. Same Settlement changes for each AS type.

Real-Time Ancillary Service Settlement (cont.)

[NPRR1010: Insert Section 6.7.5.2 below upon system implementation of the Real-Time Co-Optimization (RTC) project:]

6.7.5.2 Regulation Up Service Payments and Charges

(1) Reg-Up Imbalance Payment or Charge:

$$RTRUIMBAMT_q = (-1) * [\sum_r [RTRUREV_{q,r} - (1/4)* (PCRUR_{r,q,DAM} * RTMCPCRU)] - (1/4)*(DASARUQ_q * RTMCPCRU) + (1/4) * (RUTP_q - RUTS_q) * RTMCPCRU]$$

Where:

$$RTRUREV_{q,r} = (1/4) * RTRUAWD_{q,r} * RTMCPCRUR_{q,r}$$

$$RTMCPCRUR_{q,r} = \sum_y (RURWF_{q,r,p,y} * (RTMCPCRUS_y + RTRDPARUS_y))$$

$$RTRUAWD_{q,r} = \sum_y (RNWF_y * RTRUAWDS_{q,r,p,y})$$

Where:

$$RURWF_{q,r,p,y} = [max(0.001, RTRUAWDS_{q,r,p,y}) * TLMP_y] / [\sum_y max(0.001, RTRUAWDS_{q,r,p,y}) * TLMP_y]$$

And:

$$RNWF_y = TLMP_y / \sum_y TLMP_y$$

(2) Reg-Up Only Charge:

$$RTRUOAMT_q = (1/4) * DARUOAWD_q * RTMCPCRU$$

(3) Reg-Up Trade Overage Charges:

$$RTRUTOAMT_q = (1/4) * RTRUTO_q * RTMCPCRU$$

6.7.6 Real-Time Ancillary Service Revenue Neutrality Allocation

(1) The total cost for Real-Time Ancillary Service payments and charges is allocated to the QSEs representing Load based on Load Ratio Share (LRS). The Real-Time Ancillary Service allocations to each QSE for a given 15-minute Settlement Interval are calculated as follows:

(a) For Reg-Up:

$$LARTRUAMT_q = (-1) * (RTRUIMBAMTTOT + RTRUOAMTTOT + RTRUTOAMTTOT) * LRS_q$$

Where:

$$RTRUIMBAMTTOT = \sum_q (RTRUIMBAMT_q)$$

$$RTRUOAMTTOT = \sum_q (RTRUOAMT_q)$$

$$RTRUTOAMTTOT = \sum_q (RTRUTOAMT_q)$$

Real-Time Derated AS Capability Payment (new)

- Description of Change:
  - If ERCOT manually reduces the amount of AS that may be awarded to a Resource in RTM and causes a reduction in payment to the QSE under the RT AS Imbalance Settlement, the QSE may file a dispute under this section
  - New charge type on RTM Settlement Statement
- Protocol Section 6.7.5.7, Real-Time Derated Ancillary Service Capability Payment

(7) The Real-Time derated Ancillary Service capability payment for a given 15-minute Settlement Interval is calculated as follows:

$$RTDASAMT_q = (-1) * \text{Max } [0, \text{Min}[(RTRUILD_q + RTRDILD_q + RTRRILD_q +$$
$$RTNSILD_q + RTECRILD_q - RTEIRD_q - RTASIRD_q), \sum_r$$
$$RTDASCAP_{q,r}]]$$

Where:

$$RTDASCAP_{q,r} = (1/4) * (RTMCPCRU * RTRUDQ_{q,r} + RTMCPCRD * RTRDDQ_{q,r} +$$
$$RTMCPCRR * RTRRDQ_{q,r} + RTMCPCNS * RTNSDQ_{q,r} +$$
$$RTMCPCECR * RTECRDQ_{q,r})$$

Real-Time Derated AS Capability Charge (new)

- Description of Change:
  - Total Cost for RT Derated payments will be allocated on LRS basis
  - New charge type on RTM Settlement Statement

- Protocol Section 6.7.5.8, Real-Time Derated Ancillary Service Capability Charge

6.7.5.8 Real-Time Derated Ancillary Service Capability Charge

(1) The total cost for Real-Time derated Ancillary Service payments ~~and charges~~ is allocated to QSEs representing Load based on Load Ratio Share (LRS). The Real-Time derated Ancillary Service Payment allocations to each QSE for a given 15-minute Settlement Interval are calculated as follows:

$$LARTDASAMT_q = (-1) * RTDASAMTTOT * LRS_q$$

Where:

$$RTDASAMTTOT = \sum_q RTDASAMT_q$$

Settlement for MP Impacted by Omissions or Manual Actions to Resolve DAM

- Description of Change: Included AS Only offers into the consideration of the AS impact for this dispute-based Settlement

- Protocol Section 9.14.10, Settlement for Market Participants Impacted by Omitted Procedures or Manual Actions to Resolve the DAM

- Note: Comments were filed to NPRR1245 for these additional changes.

Day-Ahead Ancillary Services Sales Impact

$$DAMASQSEAMT_q = (-1) * \sum_r (((MCPCRU_{DAM} - RTMCPCRURUOPR_{q, r, DAM}) * (1/4) *$$

$$PCRUR_{q, r, DAM})$$

$$+ ((MCPCRD_{DAM} - RTMCPCRDRDOPR_{q, r, DAM}) * (1/4) * PCRDR_{q, r, DAM})$$

$$+ ((MCPCRR_{DAM} - RTMCPCRRRROPR_{q, r, DAM}) * (1/4) * PCRRR_{q, r, DAM})$$

$$+ ((MCPCECR_{DAM} - RTMCPCECRECRSOPR_{q, r, DAM}) * (1/4) * PCECRR_{q, r, DAM})$$

$$+ ((MCPCNS_{DAM} - RTMCPCNSNSOPR_{q, r, DAM}) * (1/4) * PCNSR_{q, r, DAM})$$

$$+ ((MCPCRU_{DAM} - RTMCPCRURUOOPR_{q, DAM}) * (1/4) * DARUOAWD_q)$$

$$+ ((MCPCRD_{DAM} - RTMCPCRDRDOOPR_{q, DAM}) * (1/4) * DARDOAWD_q)$$

$$+ ((MCPCRR_{DAM} - RTMCPCRRRROOPR_{q, DAM}) * (1/4) * DARROAWD_q)$$

$$+ ((MCPCECR_{DAM} - RTMCPCECRECRSOOPR_{q, DAM}) * (1/4) * DAECROAWD_q)$$

$$+ ((MCPCNS_{DAM} - RTMCPCNSNSOOPR_{q, DAM}) * (1/4) * DANSOAWD_q))$$

Default Uplift Invoices

- Description of Change: Includes AS Only Offers into the consideration of the Counter-Party's Maximum Market Activity (MMA)

- Protocol Section 9.19.1, Default Uplift Invoices

Where:

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

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

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

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

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

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

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

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

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

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

$$\sum_{mp} UDAASOAWD_{mp} \}$$

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

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

Market Suspension Payment

- Description of Change:
  - Updated to include consideration of ESRs for Market Suspension Payments
  - In the calculation of Market Suspension Operation Costs (MSOC), assigned the values of the variables MSAVGFP to $0/MWh and STOM to $0.30/MWh for ESRs.

- Protocol Section 25.5.2, Market Suspension Make-Whole Payment

$$MSOC_{q,r,d} = \sum_i (PAHR_{r,i} * (MSAVGFP + PFA_{rc}) + STOM_{rc}) * MSGEN_{q,r,i}$$

[NPRR1029: Replace the formula for "MSAVGP" above with the following upon system implementation:]

MSAVGFP = MSAVGFIP for Generation Resources that indicate in the Resource Registration process or the verifiable cost process to start on natural gas. For ESRs, the MSAVGFIP shall be set to zero.

STOM $_{rc}$	$/MWh	*Standard Operations and Maintenance Cost* – The standard O&M cost for the Resource category *rc* for operations above LSL, shall be set to the minimum energy variable O&M costs, as described in paragraph (6)(c) of Section 5.6.1, Verifiable Costs. For an ESR, STOM shall be set at $0.3/MWh.

![ercot logo]

Market Suspension Payment (cont.)

- Description of Change:
  - ESRs can submit additional information to ERCOT to utilize an actual O&M rate instead of the standard STOM value in the calculation of the ESR's costs
  - ESRs can recoup charging costs incurred prior to the Market Suspension period (included in the billing determinant: Market Suspension Operating Costs Adjustment (MSOCADJ))

- Protocol Section 25.5.6, Market Suspension Data Submissions

[NPRR1029: Insert paragraph (2) below upon system implementation:]

(2) Any QSE representing an ESR may submit the following information to ERCOT within five months of the Market Restart for ERCOT's use in calculating the QSE's payment pursuant to Section 25.5.2, Market Suspension Make-Whole Payment:

(a) Actual variable O&M rate incurred during the Market Suspension period in lieu of the Standard Operations and Maintenance Cost (STOM);

(b) The electricity cost incurred prior to a Market Suspension for any net amount of discharge of the battery during the Market Suspension period, if the ESR's state of charge at the end of the Market Suspension is less than the state of charge at the beginning of the period. The electricity cost incurred to charge the battery prior to a Market Suspension may include the cost of serving any auxiliary Load not measured with the settlement meters. The following information must be provided to support recovery of these costs:

(i) Battery state of charge prior to Market Suspension;

(ii) Battery state of charge at the end of the Market Suspension;

(iii) Prices paid to charge the battery for the MWh difference between (i) and (ii) above.

Market Suspension Charge

- Description of Change: Updated the LRS allocation used in the resettlement to remove any ESR load from being assessed a portion of the Market Suspension Charges

- Protocol Section 25.5.5, Market Suspension Charge Allocation

[NPRR1029: *Replace paragraph (b) above with the following upon system implementation:*]

(b) This Market Suspension Charge shall be resettled using Transmission and/or Distribution Service Provider (TDSP)-submitted actual and estimated Load data. ERCOT-estimated data will be excluded. The most recent 30 day LRS prior to the Market Suspension event, as described in paragraph (a) above, will continue to be used to allocate Startup Costs and standby payments for RMR Units and Black Start Resources. The resettled Market Suspension Charge to each QSE for a given Operating Day is calculated as follows:

$$LARTMSAMT_q = (-1) * \{(\sum_q \sum_r (MSSUC_{q,r,d} + MSSUCADJ_{q,r,d}) + \sum_h$$
$$RMRSBAMTTOT + \sum_h BSSAMTTOT) * RTMSLRS_q +$$
$$[MSMWAMTTOT_d - \sum_q \sum_r (MSSUC_{q,r,d} + MSSUCADJ_{q,r,d})$$
$$+ MSEDCIMPAMTTOT_d + MSBLTRAMTTOT_d + \sum_h$$
$$RMREAMTTOT] * AMRTSLRS_{q,d}\}$$

Where:

$$AMRTSLRS_{q,d} = Max(0, AMRTAML_{q,d} - AMRTAESRML_{q,d}) / \sum_q Max(0,$$
$$AMRTAML_{q,d} - AMRTAESRML_{q,d})$$

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RUC Make-Whole Payments

- Description of Change:
  - Excludes ESRs from receiving RUCMW payments
  - Includes RT AS revenues in the calculation of Revenue Less Costs Above LSL During RUC Committed Hours (RUCEXRR96) and Revenue Less Cost During QSE-Clawback Interval (RUCEXRQC) used to offset the RUC Guarantee

- Protocol Section 5.7.1, RUC Make-Whole Payment; 5.7.1.3, Revenue Less Cost Above LSL During RUC-Committed Hours; and 5.7.1.4, Revenue Less Cost During QSE Clawback Intervals

> *[NPRR1014: Replace paragraph (1) above with the following upon system implementation:]*
>
> (1)   To make up the difference when the revenues that a Reliability Unit Commitment (RUC)-committed Resource receives are less than its costs as described in paragraph (2) below, ERCOT shall calculate a RUC Make-Whole Payment for that Operating Day for that Resource (whether committed by Day-Ahead RUC (DRUC) or Hourly RUC (HRUC)). ERCOT shall not calculate or pay a RUC Make-Whole Payment for an Energy Storage Resource (ESR).

RUC Make-Whole Payments (cont.)

Where,

$$RUCEXRR96_{q,r,i} = RTSPP_{p,i} * Max(0, RTMG_{q,r,i} - (LSL_{q,r,i} * (\tfrac{1}{4})))$$
$$+ RTASREV_{q,r,i}$$
$$+ (-1) * (VSSVARAMT_{q,r,i} + VSSEAMT_{q,r,i})$$
$$+ (-1) * EMREAMT_{q,r,i}$$
$$- (RTEOCOST_{q,r,i} + RUCFCA_{q,r,i}) * Max(0, RTMG_{q,r,i} - (LSL_{q,r,i} * (\tfrac{1}{4})))$$

Where,

$$RTASREV_{q,r,i} = RTRUREV_{q,r,i} + RTRDREV_{q,r,i} + RTRRREV_{q,r,i} + RTECRREV_{q,r,i} + RTNSREV_{q,r,i}$$

[NPRR1009 and NPRR1014: Replace applicable portions of the formula "RUCEXRQC$_{q,r,d}$" above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009; or upon system implementation for NPRR1014:]

$$RUCEXRQC_{q,r,d} = Max\{0, \sum_i [(RTSPP_{p,i} * RTMG_{q,r,i})$$
$$+ RTASREV_{q,r,i}$$
$$+ (-1) * (VSSVARAMT_{q,r,i} + VSSEAMT_{q,r,i})$$
$$+ (-1) * EMREAMT_{q,r,i}$$
$$- [MEPR_{q,r,i} * Min(RTMG_{q,r,i}, (LSL_{q,r,i} * (\tfrac{1}{4})))]$$
$$- [RTEOCOST_{q,r,i} * Max(0, RTMG_{q,r,i} - (LSL_{q,r,i} * (\tfrac{1}{4})))]]\}$$

RUC Clawback Charges

- Description of Change:
  - Excludes ESRs from RUC Clawback Charges
  - Cleans up the RUC Clawback Charge (RUCCBAMT) calculation as approved in NPRR1172

- Protocol Section 5.7.2 RUC Clawback Charge

[NPRR1014: Insert paragraph (4) below upon system implementation and renumber accordingly:]

(4) Energy Storage Resources (ESRs) are not subject to RUC Clawback Charges.

[NPRR1172: Replace paragraph (4) above with the following upon system implementation:]

(4) For each RUC-committed Resource, the RUC Clawback Charge for each RUC-Committed Hour of the Operating Day is calculated as follows:

$$\text{RUCCBAMT}_{q,r,h} = \text{Max}\,(0, \text{RUCMEREV}_{q,r,d} + \text{RUCEXRR}_{q,r,d} + \text{RUCEXRQC}_{q,r,d} - \text{RUCACREV}_{q,r,d} - \text{RUCG}_{q,r,d}) / \text{RUCHR}_{q,r,d}$$

Where,

The RUCAC revenue is calculated for a Combined Cycle Train as follows:

$$\text{RUCACREV}_{q,r,d} = \text{Max}\{0, \sum_{i} \text{RUCMEREV96}_{q,r,i} + \text{Max}(0, \sum_{i} \text{RUCEXRR96}_{q,r,i})\}$$

RUC Decommitment Payment

- Description of Change:
  - Excludes ESRs from RUC Decommitment Payments

- Protocol Section 5.7.3, Payment When ERCOT Decommits a QSE-Committed Resource

[NPRR1014: Replace paragraph (8) above with the following upon system implementation:]

(8)   The payment for a RUC decommitment instruction for a Resource, including RMR Units and excluding ESRs, is calculated for each hour as follows:

RUC Capacity Short

- Description of Change:
  - Updated to include consideration of ESR's into the QSE's capacity calculation
  - New calculation to determine a QSE's Ancillary Service Shortfall
  - The overall shortfall calculation updated to take the maximum of the QSE's overall shortfall or their Ancillary Service Shortfall
  - To view all changes to this section for the RTC project, please refer to NPRR1236

- Protocol Section 5.7.4.1.1, Capacity Shortfall Ratio Share

- Calculations on following slide only show the equations at the RUC Snapshot. Similar equations have also been included for the end of Adjustment Period.

RUC Capacity Short (cont.)

(~~9~~10) The RUC Shortfall in MW for one QSE for one 15-minute Settlement Interval, as measured at the RUC Snapshot, is:

$$\text{RUCSFSNAP}_{ruc,q,i} = \text{Max (RUCOSFSNAP}_{ruc,q,i}, \text{RUCASFSNAP}_{ruc,q,i})$$

(~~10~~11) The overall shortfall in MW that a QSE had according to the RUC Snapshot for a 15-minute Settlement Interval is:

$$\text{RUCOSFSNAP}_{ruc,q,i} = \text{Max} (0, ((\sum_p \text{RTAML}_{q,p,i} * 4) + \text{ASONPOSSNAP}_{ruc,q,i} - \text{RUCCAPSNAP}_{ruc,q,i}))$$

The QSE's On-Line Ancillary Service Position according to the RUC Snapshot for a 15-minute Settlement Interval is:

$$\text{ASONPOSSNAP}_{ruc,q,i} = \text{RUPOSSNAP}_{ruc,q,h} + \text{RRPOSSNAP}_{ruc,q,h} + \text{ECRPOSSNAP}_{ruc,q,h} + \text{Max} (0, (\text{ECRPOSSNAP}_{ruc,q,h} + \text{NSPOSSNAP}_{ruc,q,h} - \sum_r \text{ASOFFOFRSNAP}_{ruc,q,r,h}))$$

The amount of capacity that a QSE had according to the RUC Snapshot for a 15-minute Settlement Interval is:

$$\text{RUCCAPSNAP}_{ruc,q,i} = \sum_r \text{RCAPSNAP}_{ruc,q,r,h} + (\text{RUCCPSNAP}_{ruc,q,h} - \text{RUCCSSNAP}_{ruc,q,h}) + (\sum_p \text{DAEP}_{q,p,h} - \sum_p \text{DAES}_{q,p,h}) + (\sum_p$$

$$\text{RTQQEPSNAP}_{ruc,q,p,i} - \sum_p \text{RTQQESSNAP}_{ruc,q,p,i}) + \sum_p$$

$$\text{DCIMPSNAP}_{ruc,q,p,i} + \sum_r \text{ASOFRLRSNAP}_{ruc,q,r,h} \pm \text{ESRMWSNAP}_{ruc,q,h} + \text{ESRASSNAP}_{ruc,q,h}$$

Where:

The QSE's net up Ancillary Service position (Reg-Up + RRS + ECRS + Non-Spin) covered by the QSE's portfolio of ESRs is:

$$\text{ESRASSNAP}_{ruc,q,h} = \sum_r \sum_{\text{ASSubType}} \text{ASMWCAPUSNAP}_{ruc,q,h,ASSubType,r}$$

The sum of the QSE's ESR discharging (positive) or charging (negative) output is:

$$\text{ESRMWSNAP}_{ruc,q,h} = \sum_r \text{MWSNAP}_{ruc,q,h,r}$$

(12) The Ancillary Service shortfall in MW that a QSE had according to the RUC Snapshot for a 15-minute Settlement Interval is:

$$\text{RUCASFSNAP}_{ruc,q,i} = \text{RUPOSSNAP}_{ruc,q,h} + \text{RDPOSSNAP}_{ruc,q,h} + \text{RRPOSSNAP}_{ruc,q,h} + \text{ECRPOSSNAP}_{ruc,q,h} + \text{NSPOSSNAP}_{ruc,q,h} - \text{ASMWCAPUQSNAP}_{ruc,q,h}$$

Where:

$$\text{ASMWCAPUQSNAP}_{ruc,q,h} = \sum_r \sum_{\text{ASSubType}} \text{ASMWCAPUSNAP}_{ruc,q,h,ASSubType,r}$$

$$\text{RRPOSSNAP}_{ruc,q,h} = \text{Max}(0, \text{PFPOSSNAP}_{ruc,q,h} + \text{Max}(0, \text{UFPOSSNAP}_{ruc,q,h} + \text{FFPOSSNAP}_{ruc,q,h}))$$

$$\text{ECRPOSSNAP}_{ruc,q,h} = \text{Max}(0, \text{ECSPOSSNAP}_{ruc,q,h} + \text{ECMPOSSNAP}_{ruc,q,h})$$

$$\text{NSPOSSNAP}_{ruc,q,h} = \text{Max}(0, \text{NSSPOSSNAP}_{ruc,q,h} + \text{NSMPOSSNAP}_{ruc,q,h})$$

Settlement Sections Removed

- 6.7.1, Payments for Ancillary Service Capacity Sold in a Supplemental Ancillary Services Market (SASM) or Reconfiguration Supplemental Ancillary Services Market (RSASM)
- 6.7.2, Payments for Ancillary Service Capacity Assigned in Real-Time Operations
- 6.7.2.1, Charges for Infeasible Ancillary Service Capacity Due to Transmission
- 6.7.3, Charges for a Failure to Provide Ancillary Service
- 6.7.4, Adjustments to Cost Allocations for Ancillary Services Procurement
- 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge
- 6.7.6, Real-Time Ancillary Service Imbalance Revenue Neutrality Allocation
- 6.7.7, Adjustments to Net Cost Allocations for Real-Time Ancillary Services

Settlement Charge Types Removed

Total of 34 Charge Types removed:

- RUFQAMTQSETOT
- RDFQAMTQSETOT
- RRFQAMTQSETOT
- NSFQAMTQSETOT
- ECRFQAMTQSETOT
- RUINFQAMT
- RDINFQAMT
- RRINFQAMT
- NSINFQAMT
- ECRINFQAMT
- RTRUAMT
- RTRDAMT
- RTRRAMT
- RTNSAMT
- RTECRAMT
- RTPCRUAMTQSETOT
- RTPCRDAMTQSETOT

- RTPCRRAMTQSETOT
- RTPCNSAMTQSETOT
- RTPCECRAMTQSETOT
- RTAURUAMTQSETOT
- RTAURRAMTQSETOT
- RTAUECRAMTQSETOT
- NETARTRUAMT
- NETARTRRAMT
- NETARTECRAMT
- RTASIAMT
- RTRDASIAMT
- RTRUCRSVAMT
- RTRDRUCRSVAMT
- LAASIRNAMT
- LARDASIRNAMT
- BDAMTQSETOT (renamed)
- LABPDAMT (renamed)

Settlement Charge Types Added

Total of 34 Charge Types added:

- DAPCRUOAMT
- DAPCRDOAMT
- DAPCRROAMT
- DAPCNSOAMT
- DAPCECROAMT
- DARTPCRUAMT
- DARTPCRDAMT
- DARTPCRRAMT
- DARTPCNSAMT
- DARTPCECRAMT
- RTDASAMT
- LARTDASAMT
- RTRUIMBAMT
- RTRDIMBAMT
- RTRRIMBAMT
- RTNSIMBAMT
- RTECRIMBAMT

- RTRUOAMT
- RTRDOAMT
- RTRROAMT
- RTNSOAMT
- RTECROAMT
- RTRUTOAMT
- RTRDTOAMT
- RTRRTOAMT
- RTNSTOAMT
- RTECRTOAMT
- LARTRUAMT
- LARTRDAMT
- LARTRRAMT
- LARTNSAMT
- LARTECRAMT
- SPDAMTQSETOT (renamed)
- LASPDAMT (renamed)

Settlement Statements, Invoices & Extracts

- No changes to the structure of Settlement Statements, Invoices and Extracts

- New charges and billing determinants will flow onto existing Statements and Extracts

Billing Determinant Mapping

- Two tabs in Excel workbook:
  - New Billing Determinants – Lists all the new billing determinants introduced with this project, as well as a short description of the acronym, extract and extract tables it can be found.
  - Removed Billing Determinants – Lists all billing determinants that will no longer be extracted to Market Participants post RTC+B, along with the associated extract and extract table it will be removed from.

	A	B	C	D
1	Billing Determinant	Short Description	Extract	Extract Table
2	DAPCRUAMTTOT	Day-Ahead Procured Capacity for Reg-Up Amount Total	DAM MODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
3	DAPCRDAMTTOT	Day-Ahead Procured Capacity for Reg-Down Amount Total	DAM MODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
4	DAPCRRAMTTOT	Day-Ahead Procured Capacity for Responsive Reserve Amount Total	DAM MODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
5	DAPCNSAMTTOT	Day-Ahead Procured Capacity for Non-Spin Amount Total	DAM MODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
6	DAPCECRAMTTOT	Day-Ahead Procured Capacity for ERCOT Contingency Reserve Amount Total	DAM MODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
7	DAPCRUOAMT	Day-Ahead Procured Capacity for Reg-Up Only Amount per QSE	DAM CODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
8	DAPCRDOAMT	Day-Ahead Procured Capacity for Reg-Down Only Amount per QSE	DAM CODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
9	DAPCRROAMT	Day-Ahead Procured Capacity for Responsive Reserve Only Amount per QSE	DAM CODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
10	DAPCNSOAMT	Day-Ahead Procured Capacity for Non-Spin Only Amount per QSE	DAM CODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
11	DAPCECROAMT	Day-Ahead Procured Capacity for ERCOT Contingency Reserve Service Only Amount per QSE	DAM CODE	DAMOUTPUTHEADER DAMOUTPUTINTERVAL
12	DARUOAWD	Day-Ahead Reg-Up Only Award for the QSE	SID & DAM CODE	MKTINPUTHEADER MKTINPUTINTERVAL

Thank You

Appendix

- [RTC Key Principles](#)
- [RTC Key Documents](#)
- [BESTF Key Documents](#)