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| NPRR Number | [1269](https://www.ercot.com/mktrules/issues/NPRR1269) | NPRR Title | RTC+B Three Parameters Policy Issues |
| **Date of Decision** | May 15, 2025 |
| **Action** | Approved |
| **Timeline**  | Urgent |
| **Estimated Impacts** | Cost/Budgetary: None Project Duration: No project required  |
| **Effective Date** | Upon system implementation of PR447, Real-Time Co-Optimization (RTC) |
| **Priority and Rank Assigned** | Not applicable |
| **Nodal Protocol Sections Requiring Revision**  | 4.4.12, Determination of Ancillary Service Demand Curves for the Day-Ahead Market and Real-Time Market5.5.2, Reliability Unit Commitment (RUC) Process6.5.7.3, Security Constrained Economic Dispatch |
| **Related Documents Requiring Revision/Related Revision Requests** | None |
| Revision Description | This Nodal Protocol Revision Request (NPRR) determines and codifies a group of policy changes that were deferred from the original RTC-related Protocols developed in 2020. The three policy concepts below have been developed in coordination with the Real-Time Co-optimization plus Batteries Task Force (RTCBTF):* Parameters for Ancillary Service proxy offers floors;
* Scaling factor values for ramping; and
* Ancillary Service Demand Curves (ASDCs) for use in Reliability Unit Commitment (RUC) studies.
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| Reason for Revision |  [Strategic Plan](https://www.ercot.com/files/docs/2023/08/25/ERCOT-Strategic-Plan-2024-2028.pdf) Objective 1 – Be an industry leader for grid reliability and resilience [Strategic Plan](https://www.ercot.com/files/docs/2023/08/25/ERCOT-Strategic-Plan-2024-2028.pdf) Objective 2 - Enhance the ERCOT region’s economic competitiveness with respect to trends in wholesale power rates and retail electricity prices to consumers [Strategic Plan](https://www.ercot.com/files/docs/2023/08/25/ERCOT-Strategic-Plan-2024-2028.pdf) Objective 3 - Advance ERCOT, Inc. as an independent leading industry expert and an employer of choice by fostering innovation, investing in our people, and emphasizing the importance of our mission General system and/or process improvement(s) Regulatory requirements ERCOT Board/PUCT Directive*(please select ONLY ONE – if more than one apply, please select the ONE that is most relevant)* |
| Justification of Reason for Revision and Market Impacts | The RTCBTF has reviewed the NPRR language and there was no opposition to moving this forward into the formal stakeholder process. However, some of the details are still under review at the RTCBTF and all other stakeholder feedback is welcome. The goal for this NPRR is to be recommended for approval at the March 2025 Protocol Revision Subcommittee (PRS) meeting, March 2025 Technical Advisory Committee (TAC) meeting and April 2025 ERCOT Board of Directors (ERCOT Board) meeting; to support the May 2025 market trial activities. |
| PRS Decision | On 2/12/25, PRS voted unanimously to table NPRR1269. All Market Segments participated in the vote.On 3/12/25, PRS voted to grant NPRR1269 Urgent status; to recommend approval of NPRR1269 as amended by the 3/4/25 TCPA comments; and to forward to TAC NPRR1269 and the 1/28/25 Impact Analysis. There were three opposing votes from the Consumer (Residential Consumer, City of Eastland, Occidental) Market Segment. All Market Segments participated in the vote. |
| Summary of PRS Discussion | On 2/12/25, the sponsor provided an overview of NPRR1269 and participants reviewed the 2/6/25 IMM comments. Participants tabled NPRR1269 for continued discussions at upcoming RTCBTF meetings, and the sponsor noted they plan to request Urgent status for NPRR1269 at the March PRS meeting to keep this NPRR on-track for PUCT approval ahead of RTC+B market trials later this year.On 3/12/25, participants reviewed the 3/3/25 ERCOT comments, 3/4/25 TCPA comments, 3/10/25 TIEC comments, and 3/11/25 IMM comments, along with a presentation from ERCOT. Participants discussed the appropriate levels and potential impact of ASDC floors within RUC, the Day-Ahead Market (DAM), and the Real-Time Market (RTM). |
| TAC Decision | On 3/26/25, TAC voted to recommend approval of NPRR1269 as recommended by PRS in the 3/12/25 PRS Report. There were seven opposing votes from the Consumer (6) (Residential Consumer, OPUC, CMC Steel, Lyondell Chemical, City of Eastland, City of Dallas) and Independent Retail Electric Provider (IREP) (APG&E) Market Segments and one abstention from the IREP (Demand Control 2) Market Segment. All Market Segments participated in the vote. |
| Summary of TAC Discussion | On 3/26/25, TAC reviewed the items below, along with a presentation from ERCOT Staff on the impact of proposed ASDC floors for the DAM and RTC. Participants discussed the potential impacts of NPRR1269 on the occurrence of RUCs under RTC. Opponents continued to express concerns with any floor above $0 without observed market conditions under RTC justifying one. |
| Explanation of Opposing TAC Votes | **Consumer/Residential Consumer** – Residential Consumers opposed NPRR1269 for reasons detailed in the 3/25/25 Joint Consumers comments.**Consumer/OPUC** – OPUC opposed NPRR1269 for reasons detailed in the 3/25/25 Joint Consumers comments.**Consumer/City of Eastland** – Explanation requested but not provided.**Consumer/City of Dallas** – City of Dallas voted against NPRR1269 for fundamental market design issues. NPRR1269 sets a floor for the proxy offer curve. The justification for the offer floor is the belief that this may reduce potential RUC in the future. Although RUC is an out-of-market solution and should be avoided if possible substituting an arbitrary offer floor is in itself an out-of-market solution. We are simply substituting administrative pricing for RUC commitment. Neither option is acceptable. The ERCOT “competitive” market has more administrative pricing and price adders than any competitive market we are aware of. RTC was intended to add efficiency, transparency and lower cost to the ERCOT market. At this point in time we do not know how Market Participants will offer into the new market, and to set offer floors before the market even opens is defeatist and anticompetitive.**Consumer/CMC Steel** – CMC Steel opposed NPRR1269 for reasons detailed in the 3/25/25 Joint Consumers comments.**Consumer/Lyondell Chemical** – Lyondell Chemical opposed NPRR1269 for reasons detailed in the 3/25/25 Joint Consumers comments.**IREP/APG&E** – APG&E opposed NPRR1269 for reasons detailed in the 3/25/25 Joint Consumers comments.  |
| TAC Review/Justification of Recommendation |  Revision Request ties to Reason for Revision as explained in Justification  Impact Analysis reviewed and impacts are justified as explained in Justification Opinions were reviewed and discussed Comments were reviewed and discussed (if applicable) Other: (explain) |
| ERCOT Board Decision | On 4/8/25, the ERCOT Board voted to recommend approval of NPRR1269 as recommended by TAC in the 3/26/25 TAC Report. There was one opposing vote. |
| PUCT Decision | On 5/15/25, the PUCT approved NPRR1269 and accompanying ERCOT Market Impact Statement as presented in Project No. 54445, Review of Protocols Adopted by the Independent Organization. |

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| **Opinions** |
| **Credit Review** | ERCOT Credit Staff and the Credit Finance Sub Group (CFSG) have reviewed NPRR1269 and do not believe that it requires changes to credit monitoring activity or the calculation of liability. |
| **Independent Market Monitor Opinion** | IMM opposes NPRR1269. |
| **ERCOT Opinion** | ERCOT supports approval of NPRR1269. |
| **ERCOT Market Impact Statement** | ERCOT Staff has reviewed NPRR1269 and believes the market impact for NPRR1269, after extensive review with stakeholders at the RTCBTF, codifies a group of policy changes that were deferred from the original RTC-related Protocols developed in 2020 to provide clarity ahead of the upcoming RTC market trials. |

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| Market Segment | Not applicable |

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| **Comments Received** |
| **Comment Author** | **Comment Summary** |
| IMM 020625 | Opined that a proxy price for Ancillary Services at $2,000 is arbitrary and excessively high relative to the cost to provide the service  |
| ERCOT 030325 | Proposed revisions replacing placeholder “X” values within the Protocol language and proposing that all ASDCs for RUC have a price floor such that no value on the curve for any Ancillary Service fall bellow $15 per MW per hour |
| TCPA 030425 | Proposed additional revisions to the 3/3/25 ERCOT comments to carry the proposed $15 per MW per hour floor from RUC into the DAM and RTM as well |
| TIEC 031025 | Proposed additional revisions to the 3/3/25 ERCOT comments lowering the proposed Ancillary Service proxy offer floor from $2,000 per MW per hour to $15 per MW per hour |
| IMM 031125 | Responded to the 3/10/25 TCPA comments and provided supporting analysis of the impact of ASDC price floors in 2024 |
| Joint Consumers 032525 | Expressed concern that NPRR1269 proposes a fundamental, premature and arbitrary shift in RTC design before its implementation and proposed a compromise to modify the proposed floor price from $15 to $0 for monitoring throughout 2026 |
| ERCOT 033125 | Provided ERCOT’s perspective on the concept of an ASDC floor in the DAM and RTM and the appropriate level for the Ancillary Service proxy offer floor; summarized results of the analysis of the impact of NPRR1269 |
| Joint Consumers 040425 | Reiterated opposition to the proposed $15 floor price and encouraged the Board to recommend approval of NPRR1269 as amended by the 3/25/25 Joint Consumers comments |

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| Market Rules Notes |

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

* NPRR1235, Dispatchable Reliability Reserve Service as a Stand-Alone Ancillary Service
	+ Section 4.4.12
	+ Section 5.5.2
* NPRR1268, RTC – Modification of Ancillary Service Demand Curves
	+ Section 4.4.12
	+ Section 6.5.7.3

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| Proposed Protocol Language Revision |

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| ***[NPRR1008, NPRR1216, and NPRR1245: Insert applicable portions of Section 4.4.12 below upon system implementation of NPRR1216; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1008 and NPRR1245:]******4.4.12 Determination of Ancillary Service Demand Curves for the Day-Ahead Market and Real-Time Market***(1) This Section describes the process for determining ASDCs for Regulation Up Service (Reg-Up), Regulation Down Service (Reg-Down), Responsive Reserve (RRS), ERCOT Contingency Reserve Service (ECRS), and Non-Spinning Reserve (Non-Spin) for the Day-Ahead Market (DAM) and Real-Time Market (RTM). This section does not apply to ASDCs used in the Reliability Unit Commitment (RUC) process.(2) The DAM shall use the same ASDCs as the RTM, as an initial condition. Specific to the DAM, the ASDCs will be adjusted, as needed, to account for negative Self-Arranged Ancillary Service Quantities.(3) For Reg-Down, the ASDC shall be a constant value equal to VOLL for the full range of the Ancillary Service Plan for Reg-Down. (4) To determine the individual ASDCs for Reg-Up, RRS, ECRS, and Non-Spin, an Aggregate ORDC (AORDC) will be created and then disaggregated into individual curves for the different Ancillary Services.(5) ERCOT shall develop the AORDC from historical data from the period of June 1, 2014 through August 31, 2025 as follows:(a) For all SCED intervals where the sum of RTOLCAP and RTOFFCAP is less than 10,000 MW, use the RTOLCAP and RTOFFCAP values to calculate the AORDC as follows:$$AORDC=\left(0.5\*\left(1-pnorm\left(RTOLCAP-3000, 0.5\*μ, 0.707\*σ\right)\right)+0.5\*\left(1-pnorm\left(RTOLCAP+RTOFFCAP-3000, μ, σ\right)\right)\right)\*\left(VOLL-min\left(System Lambda, 250\right)\right)$$The above variables are defined as follows:

| **Variable** | **Unit** | **Definition** |
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| RTOLCAP | MWh | *Real-Time On-Line Reserve Capacity –* The Real-Time reserve capacity of On-Line Resources available for the SCED intervals beginning June 1, 2014 through August 31, 2025 |
| RTOFFCAP | MWh | *Real-Time Off-Line Reserve Capacity –* The Real-Time reserve capacity of Off-Line Resources available for the SCED intervals beginning June 1, 2014 through August 31, 2025. |
| *μ* | None | The mean value of the shifted LOLP distribution as published for Summer 2026 |
| *σ* | None | The standard deviation of the shifted LOLP distribution as published for Summer 2026 |

(b) Using the results of step (a) above, use regression methods to fit a curve to the average reserve pricing outcomes for the various MW reserve levels.(c) Calculate points on the regression curve in 1 MW increments for any observed reserve level >= 3,000 MW and price >$0.01/MWh. These points form the AORDC.(6) ERCOT shall disaggregate the AORDC developed pursuant to paragraph (5) above into individual ASDCs for each Ancillary Service product as follows:(a) The ASDC for all Reg-Up in the Ancillary Service Plan shall use the highest price portion of the AORDC;(b) The ASDC for all RRS in the Ancillary Service Plan shall use the highest price portion of the remaining AORDC after removing the portion of the AORDC that was used for the Reg-Up ASDC; (c) The ASDC for all ECRS in the Ancillary Service Plan shall use the highest price portion of the remaining AORDC after removing the portions of the AORDC that were used for the Reg-Up and RRS ASDCs;(d) The ASDC for Non-Spin shall use the remaining portion of the remaining AORDC after removing the portions of the AORDC that were used for the Reg-Up, RRS, and ECRS ASDCs.(7) Each ASDC will be represented by a 100-point linear approximation to the corresponding part of the AORDC. Fewer points may be used for cases where it would not result in decreased accuracy in representing the corresponding part of the AORDC.(8) All ASDCs will have a floor price, based on ERCOT’s assessment of the need for a floor price on the ASDC for RUC, such that no values on the curve for any Ancillary Service fall below $15 per MW per hour for the portion of the ASDC that corresponds to the Ancillary Service Plan.(9) The AORDC used in determining the individual ASDCs will be adjusted to reflect any updates to the value of VOLL, as described in Section 4.4.11, Day-Ahead and Real-Time System-Wide Offer Caps, and Section 4.4.11.1, Scarcity Pricing Mechanism. |

***5.5.2 Reliability Unit Commitment (RUC) Process***

(1) The RUC process recommends commitment of Generation Resources, to match ERCOT’s forecasted Load including Direct Current Tie (DC Tie) Schedules, subject to all transmission constraints and Resource performance characteristics. The RUC process takes into account Resources already committed in the Current Operating Plans (COPs), Resources already committed in previous RUCs, Off-Line Available Resources having a start-up time of one hour or less, and Resource capacity already committed to provide Ancillary Service. The formulation of the RUC objective function must employ penalty factors on violations of security constraints. The objective of the RUC process is to minimize costs based on the Resource costs described in paragraphs (5) through (9) below. For all hours of the RUC Study Period within the RUC process, Quick Start Generation Resources (QSGRs) with a COP Resource Status of OFFQS shall be considered as On-Line with Low Sustained Limit (LSL) at zero MW. QSGRs with a Resource Status of OFFQS shall only be committed by ERCOT through a RUC instruction in instances when a reliability issue would not otherwise be managed through Dispatch Instructions from Security-Constrained Economic Dispatch (SCED). For On-Line ESRs, the Hour Beginning Planned State of Charge (SOC) values provided in the COP for a given hour are discounted to ensure sufficient SOC is preserved to meet Ancillary Service Resource Responsibilities, as reflected in the COP. Any remaining SOC on the ESR will be considered available for energy dispatch by RUC while respecting the Minimum State of Charge (MinSOC) and Maximum State of Charge (MaxSOC) values provided in the COP.

(2) The RUC process can recommend Resource decommitment. ERCOT may only decommit a Resource to resolve transmission constraints that are otherwise unresolvable. Qualifying Facilities (QFs) may be decommitted only after all other types of Resources have been assessed for decommitment. In addition, the HRUC process provides decision support to ERCOT regarding a Resource decommitment requested by a Qualified Scheduling Entity (QSE).

(3) ERCOT shall review the RUC-recommended Resource commitments and the list of Off-Line Available Resources having a start-up time of one hour or less to assess feasibility and shall make any changes that it considers necessary, in its sole discretion. During the RUC process, ERCOT may also review and commit, through a RUC instruction, Combined Cycle Generation Resources that are currently planned to be On-Line but are capable of transitioning to a configuration with additional capacity. ERCOT may deselect Resources recommended in DRUC and in all HRUC processes if in ERCOT’s sole discretion there is enough time to commit those Resources in the future HRUC processes, taking into account the Resources’ start-up times, to meet ERCOT System reliability. After each RUC run, ERCOT shall post the amount of capacity deselected per hour in the RUC Study Period to the MIS Secure Area. A Generation Resource shown as On-Line and available for SCED dispatch for an hour in its COP prior to a DRUC or HRUC process execution, according to Section 5.3, ERCOT Security Sequence Responsibilities, will be considered self-committed for that hour. For purpose of Settlement, snapshot data will be used as specified in paragraph (2) of Section 5.3. ERCOT shall issue RUC instructions to each QSE specifying its Resources that have been committed as a result of the RUC process. ERCOT shall, within one day after making any changes to the RUC-recommended commitments, post to the MIS Secure Area any changes that ERCOT made to the RUC-recommended commitments with an explanation of the changes.

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| ***[NPRR1239: Replace paragraph (3) above with the following upon system implementation:]***(3) ERCOT shall review the RUC-recommended Resource commitments and the list of Off-Line Available Resources having a start-up time of one hour or less to assess feasibility and shall make any changes that it considers necessary, in its sole discretion. During the RUC process, ERCOT may also review and commit, through a RUC instruction, Combined Cycle Generation Resources that are currently planned to be On-Line but are capable of transitioning to a configuration with additional capacity. ERCOT may deselect Resources recommended in DRUC and in all HRUC processes if in ERCOT’s sole discretion there is enough time to commit those Resources in the future HRUC processes, taking into account the Resources’ start-up times, to meet ERCOT System reliability. After each RUC run, ERCOT shall post the amount of capacity deselected per hour in the RUC Study Period to the ERCOT website. A Generation Resource shown as On-Line and available for SCED dispatch for an hour in its COP prior to a DRUC or HRUC process execution, according to Section 5.3, ERCOT Security Sequence Responsibilities, will be considered self-committed for that hour. For purpose of Settlement, snapshot data will be used as specified in paragraph (2) of Section 5.3. ERCOT shall issue RUC instructions to each QSE specifying its Resources that have been committed as a result of the RUC process. ERCOT shall, within one day after making any changes to the RUC-recommended commitments, post to the ERCOT website any changes that ERCOT made to the RUC-recommended commitments with an explanation of the changes. |

(4) A QSE shall notify the ERCOT Operator of any physical limitation that impacts its Resource’s ability to start that is not reflected in the Resource’s COP or the Resource’s startup time, minimum On-Line time, or minimum Off-Line time. The following shall apply:

(a) If a Resource receives a RUC Dispatch Instruction that it cannot meet due to a physical limitation described in paragraph (4) above, the QSE representing the Resource shall notify the ERCOT Operator of the inability to fully comply with the instruction and shall comply with the instruction to the best of the Resource’s ability. If the QSE has provided the ERCOT Operator notice of that limitation at least seven days prior to the Operating Day in which the instruction occurs, the QSE shall be excused from complying with the portion of the RUC Dispatch Instruction that it could not meet due to the identified limitation.

(b) If a QSE provides notice pursuant to paragraph (a) above of a physical limitation that will delay the RUC-committed Resource’s ability to reach its LSL in accordance with a RUC Dispatch Instruction, ERCOT shall extend the RUC Dispatch Instruction so that the Resource’s minimum run time is respected. However, if the Resource will not be available in time to address the issue for which it received the RUC instruction, ERCOT may instead cancel the RUC Dispatch Instruction.

(5) A QSE shall be excused from complying with any portion of a RUC Dispatch Instruction that it could not meet due to a physical limitation that was reflected, at the time of the RUC Dispatch Instruction, in the Resource’s COP, startup time, minimum On-Line time, or minimum Off-Line time.

(6) To determine the projected energy output level of each Resource and to project potential congestion patterns for each hour of the RUC, ERCOT shall calculate proxy Energy Offer Curves based on the Mitigated Offer Caps (MOCs) for the type of Resource as specified in Section 4.4.9.4, Mitigated Offer Cap and Mitigated Offer Floor, for use in the RUC. Proxy Energy Offer Curves are calculated by multiplying the MOC by a constant selected by ERCOT from time to time that is no more than 0.10% and applying the cost for all Generation Resource output between High Sustained Limit (HSL) and LSL. The intent of this process is to minimize the effect of the proxy Energy Offer Curves on optimization.

(7) ERCOT shall use the RUC process to evaluate the need to commit Resources for which a QSE has submitted Three-Part Supply Offers and other available Off-Line Resources in addition to Resources that are planned to be On-Line during the RUC Study Period. All of the above commitment information must be as specified in the QSE’s COP. For available Off-Line Resources with a cold start time of one hour or less that have not been removed from special consideration under paragraph (9) below pursuant to paragraph (4) of Section 8.1.2, Current Operating Plan (COP) Performance Requirements, the Startup Offers and Minimum-Energy Offer from a Resource’s Three-Part Supply Offer shall not be used in the RUC process.

(8) ERCOT shall create Three-Part Supply Offers for all Resources that did not submit a Three-Part Supply Offer, but are specified as available but Off-Line, excluding Resources with a Resource Status of EMR, in a QSE’s COP. For such Resources, excluding available Off-Line Resources with a cold start time of one hour or less that have not been removed from special consideration under paragraph (9) below pursuant to paragraph (4) of Section 8.1.2, ERCOT shall use in the RUC process 100% of any approved verifiable Startup Cost and verifiable minimum-energy cost or if verifiable costs have not been approved, the applicable Resource Category Generic Startup Offer Cost and the applicable Resource Category Generic Minimum-Energy Offer Cost as described specified in Section 4.4.9.2.3, Startup Offer and Minimum-Energy Offer Generic Caps, registered with ERCOT. Also, for Settlement purposes, ERCOT shall use any approved verifiable Startup Costs and verifiable minimum-energy cost for such Resources, or if verifiable costs have not been approved, the applicable Resource Category Generic Startup Offer Cost and Generic Minimum-Energy Offer Cost.

(9) For all available Off-Line Resources having a cold start time of one hour or less and not removed from special consideration pursuant to paragraph (4) of Section 8.1.2, ERCOT shall scale any approved verifiable Startup Cost and verifiable minimum-energy cost or if verifiable costs have not been approved, the applicable Resource Category Generic Startup Offer Cost and the applicable Resource Category Generic Minimum-Energy Offer Cost as specified in Section 4.4.9.2.3 for use in the RUC process.

The above parameter is defined as follows:

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| **Parameter** | **Unit** | **Current Value\*** |
| 1HRLESSCOSTSCALING | Percentage | Maximum value of 100% |
| \* The current value for the parameter(s) referenced in this table above will be recommended by the Technical Advisory Committee (TAC) and the ERCOT Board and approved by the Public Utility Commission of Texas (PUCT). ERCOT shall update parameter value(s) on the first day of the month following PUCT approval unless otherwise directed. ERCOT shall provide a Market Notice prior to implementation of a revised parameter value. |

(10) The RUC process must treat all Resource capacity providing Ancillary Service as unavailable for the RUC Study Period, unless that treatment leads to infeasibility (i.e., that capacity is needed to resolve some local transmission problem that cannot be resolved by any other means). If an ERCOT Operator decides that the Ancillary Service capacity allocated to that Resource is infeasible based on ERCOT System conditions, then, ERCOT shall inform each affected QSE of the amount of its Resource capacity that does not qualify to provide Ancillary Service, and the projected hours for which this is the case. In that event, the affected QSE may, under Section 6.4.9.1.2, Replacement of Infeasible Ancillary Service Due to Transmission Constraints, either:

(a) Substitute capacity from Resources represented by that QSE;

(b) Substitute capacity from other QSEs using Ancillary Service Trades; or

(c) Ask ERCOT to replace the capacity.

(11) Factors included in the RUC process are:

(a) ERCOT System-wide hourly Load forecast allocated appropriately over Load buses;

(b) Transmission constraints – Transfer limits on energy flows through the electricity network;

* (i) Thermal constraints – protect transmission facilities against thermal overload;
* (ii) Generic constraints – protect the transmission system against transient instability, dynamic instability or voltage collapse;

(c) Planned transmission topology;

(d) Energy sufficiency constraints;

(e) Inputs from the COP, as appropriate;

(f) Inputs from Resource Parameters, including a list of Off-Line Available Resources having a start-up time of one hour or less, as appropriate;

(g) Each Generation Resource’s Minimum-Energy Offer and Startup Offer, from its Three-Part Supply Offer;

(h) Any Generation Resource that is Off-Line and available but does not have a Three-Part Supply Offer;

(i) Forced Outage information; and

(j) Inputs from the eight-day look ahead planning tool, which may potentially keep a unit On-Line (or start a unit for the next day) so that a unit minimum duration between starts does not limit the availability of the unit (for security reasons).

(12) The HRUC process and the DRUC process are as follows:

(a) The HRUC process uses current Resource Status for the initial condition for the first hour of the RUC Study Period. All HRUC processes use the projected status of transmission breakers and switches starting with current status and updated for each remaining hour in the study as indicated in the COP for Resources and in the Outage Scheduler for transmission elements.

(b) The DRUC process uses the Day-Ahead forecast of total ERCOT Load including DC Tie Schedules for each hour of the Operating Day. The HRUC process uses the current hourly forecast of total ERCOT Load including DC Tie Schedules for each hour in the RUC Study Period.

(c) The DRUC process uses the Day-Ahead weather forecast for each hour of the Operating Day. The HRUC process uses the weather forecast information for each hour of the balance of the RUC Study Period.

(13) A QSE that has one or more of its Resources RUC-committed to provide Ancillary Services must increase its Ancillary Service Supply Responsibility by the total amount of RUC-committed Ancillary Service quantities. The QSE may only use a RUC-committed Resource to meet its Ancillary Service Supply Responsibility during that Resource’s RUC-Committed Interval if the Resource has been committed by the RUC process to provide Ancillary Service, or the Resource is a Combined Cycle Generation Resource that was RUC-committed to transition from one On-Line configuration to a different configuration with additional capacity. For cases in which the commitment was to provide Ancillary Service, the QSE shall indicate the exact amount and type of Ancillary Service for which it was committed as the Resource’s Ancillary Service Resource Responsibility and Ancillary Services Schedule for the RUC-Committed Intervals for both telemetry and COP information provided to ERCOT. Upon deployment of the Ancillary Services, the QSE shall adjust its Ancillary Services Schedule to reflect the amounts requested in the deployment.

(14) A QSE with a Resource that is not a Reliability Must-Run (RMR) Unit or has not received an Outage Schedule Adjustment (OSA) that has been committed in a DRUC or HRUC process may opt out of the RUC Settlement (or “buy back” the commitment) by setting the COP status of the RUC-committed Resource to ONOPTOUT for the first hour of a contiguous block of RUC-Committed Hours in the Opt Out Snapshot. All the configurations of the same Combined Cycle Train shall be treated as the same Resource for the purpose of creating the block of RUC-Committed Hours. A RUC-committed Combined Cycle Generation Resource may opt out of the RUC Settlement by setting the COP status of any Combined Cycle Generation Resource within the same Combined Cycle Train as the RUC-committed Resource to ONOPTOUT for the first hour of a contiguous block of RUC-Committed Hours in the Opt Out Snapshot. A Combined Cycle Generation Resource that is RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity may opt out of the RUC Settlement following the same rule for RUC-committed Combined Cycle Generation Resources described above. A QSE that opts out of RUC Settlement forfeits RUC Settlement for the affected Resource for a given block of RUC Buy-Back Hours. A QSE that opts out of RUC Settlement treatment must make the Resource available to SCED for all RUC Buy-Back Hours. All hours in a contiguous block of RUC-Committed Hours that includes the RUC Buy-Back Hour shall be considered RUC Buy-Back Hours. If a contiguous block of RUC-Committed Hours spans more than one Operating Day and a QSE wishes to opt out of RUC Settlement for the RUC-Committed Hours in the second or subsequent Operating Day, the QSE must set its COP status to ONOPTOUT for the first hour of the first Operating Day in the Opt Out Snapshot of the first Operating Day.

(15) ERCOT shall, as soon as practicable, post to the MIS Secure Area a report identifying those hours that were considered RUC Buy-Back Hours, along with the name of each RUC-committed Resource whose QSE opted out of RUC Settlement.

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| ***[NPRR1239: Replace paragraph (15) above with the following upon system implementation:]***(15) ERCOT shall, as soon as practicable, post to the ERCOT website a report identifying those hours that were considered RUC Buy-Back Hours, along with the name of each RUC-committed Resource whose QSE opted out of RUC Settlement. |

(16) A Resource that has a Three-Part Supply Offer cleared in the Day-Ahead Market (DAM) and subsequently receives a RUC commitment for the Operating Hour for which it was awarded will be treated as if the telemetered Resource Status was ONOPTOUT for purposes of Section 6.5.7.3, Security Constrained Economic Dispatch, and Section 6.5.7.3.1, Determination of Real-Time On-Line Reliability Deployment Price Adder.

(17) A Resource that has self-committed for an Operating Hour after the RUC Snapshot was taken but before the RUC commitment has been communicated through an XML message for that RUC process and that Operating Hour is included in a block of RUC-committed hours for that RUC process will be treated as if the Resource Status was ONOPTOUT for purposes of Section 6.5.7.3, Section 6.5.7.3.1, Operating Reserve Demand Curve (ORDC) calculations, and RUC Settlement for the entire block of RUC-committed hours. A QSE that has a Resource that meets these conditions must make the Resource available to SCED for the entire block of RUC-committed hours. ERCOT will send the QSE a notification stating the Operating Day and block of hours for which this occurred.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***[NPRR1009, NPRR1032, NPRR1204, NPRR1239, and NPRR1245: Replace applicable portions of Section 5.5.2 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009, NPRR1204, and NPRR1245; or upon system implementation for NPRR1032 or NPRR1239:]******5.5.2 Reliability Unit Commitment (RUC) Process***(1) The RUC process recommends commitment of Generation Resources, to match ERCOT’s forecasted Load including Direct Current Tie (DC Tie) Schedules and RUC Ancillary Service Demand Curves (ASDCs), subject to all transmission constraints and Resource performance characteristics. The RUC process takes into account Resources already committed in the Current Operating Plans (COPs), Resources already committed in previous RUCs, and Off-Line Available Resources having a start-up time of one hour or less. For On-Line Energy Storage Resources (ESRs), using RUC duration requirements for energy and Ancillary Services, RUC-projected dispatch for energy and Ancillary Service in one interval shall respect the ESR’s minimum and maximum State of Charge (SOC) values from the COP, while incorporating any adjustments under paragraph (19)(d) below. In addition, using the Ancillary Service Deployment Factors and their respective deployment duration requirements, the SOC required to support these dispatch levels for energy and Ancillary Services will match as closely as possible the difference between the adjusted COP values of the next interval’s Hour Beginning Planned SOC and the current interval’s Hour Beginning Planned SOC. The formulation of the RUC objective function must employ penalty factors on violations of security constraints and violations of ESR COP Hour Beginning Planned SOC. The objective of the RUC process is to minimize costs based on the Resource costs described in paragraphs (11) through (15) below. ESR energy dispatch costs and Ancillary Service Offer costs are not included in the RUC objective function.(2) ERCOT shall create an ASDC for each Ancillary Service for use in RUC. The ASDCs for each Ancillary Service for use in RUC shall be substantively the same as the ASDCs defined in Protocol Section 4.4.12, Determination of Ancillary Service Demand Curves for the Day-Ahead Market and the Real-Time Market. Specific to RUC, the ASDC for Non-Spin shall not extend beyond the Ancillary Service Plan for Non-Spin for the relevant Operating Hour. ERCOT shall post the ASDCs for RUC to the ERCOT website following each execution of the RUC process.(3) ERCOT shall post the following Ancillary Service Deployment Factor data on the ERCOT website:(a) Following each execution of RUC, ERCOT shall post the Ancillary Service Deployment Factors used by that RUC process for each hour in the RUC Study Period;(b) No later than 0600 in the Day-Ahead for each Operating Day, ERCOT shall post the Ancillary Service Deployments Factors that are projected to be used in the RUC process for that Operating Day; and(c) Following each month, ERCOT shall post the average, minimum, and maximum Ancillary Service Deployment Factors used in the RUC process by type of Ancillary Service and hour of the day for the month.(4) For all hours of the RUC Study Period within the RUC process, Quick Start Generation Resources (QSGRs) with a COP Resource Status of OFFQS shall be considered as On-Line with Low Sustained Limit (LSL) at zero MW. QSGRs with a Resource Status of OFFQS shall only be committed by ERCOT through a RUC instruction in instances when a reliability issue would not otherwise be managed through Dispatch Instructions from Security-Constrained Economic Dispatch (SCED). (5) In addition to On-Line qualified Generation Resources and Energy Storage Resources (ESRs), the RUC engine shall consider a COP Resource status of OFFQS for QSGRs that are qualified for ERCOT Contingency Reserve Service (ECRS), as being eligible to provide ECRS constrained by the Ancillary Service capability in the COP.(6) In addition to On-Line qualified Generation Resources and ESRs, the RUC engine shall consider a COP Resource Status of OFFQS for QSGRs that are qualified for Non-Spinning Reserve (Non-Spin), as being eligible to provide Non-Spin constrained by the Ancillary Service Capability in the COP. The RUC engine shall also consider a COP Resource Status of OFF (Off-Line but available for commitment in the DAM and RUC) for a Resource that is qualified for Non-Spin, as being eligible to provide Non-Spin constrained by the Ancillary Service capability in the COP.(7) In addition to On-Line qualified Generation Resources and ESRs, the RUC engine shall consider a COP Resource Status of ONL for Load Resources that are qualified for Ancillary Services, as being eligible to provide Ancillary Services constrained by the Ancillary Service Capability in the COP. The RUC engine will not consider any Load Resources for dispatch of energy.(8) The RUC process can recommend Resource decommitment. ERCOT may only decommit a Resource to resolve transmission constraints that are otherwise unresolvable. Qualifying Facilities (QFs) may be decommitted only after all other types of Resources have been assessed for decommitment. In addition, the HRUC process provides decision support to ERCOT regarding a Resource decommitment requested by a Qualified Scheduling Entity (QSE). (9) ERCOT shall review the RUC-recommended Resource commitments and the list of Off-Line Available Resources having a start-up time of one hour or less to assess feasibility and shall make any changes that it considers necessary, in its sole discretion. During the RUC process, ERCOT may also review and commit, through a RUC instruction, Combined Cycle Generation Resources that are currently planned to be On-Line but are capable of transitioning to a configuration with additional capacity. ERCOT may deselect Resources recommended in DRUC and in all HRUC processes if in ERCOT’s sole discretion there is enough time to commit those Resources in the future HRUC processes, taking into account the Resources’ start-up times, to meet ERCOT System reliability. After each RUC run, ERCOT shall post the amount of capacity deselected per hour in the RUC Study Period to the ERCOT website. A Generation Resource shown as On-Line and available for SCED dispatch for an hour in its COP prior to a DRUC or HRUC process execution, according to Section 5.3, ERCOT Security Sequence Responsibilities, will be considered self-committed for that hour. For purpose of Settlement, snapshot data will be used as specified in paragraph (2) of Section 5.3. (10) ERCOT shall issue RUC instructions to each QSE specifying its Resources that have been committed as a result of the RUC process. ERCOT shall, within one day after making any changes to the RUC-recommended commitments, post to the ERCOT website any changes that ERCOT made to the RUC-recommended commitments with an explanation of the changes.(11) ERCOT shall use the RUC process to evaluate the need to commit Resources for which a QSE has submitted Three-Part Supply Offers and other available Off-Line Resources in addition to Resources that are planned to be On-Line during the RUC Study Period. All of the above commitment information must be as specified in the QSE’s COP. For available Off-Line Resources with a cold start time of one hour or less that have not been removed from special consideration under paragraph (17) below pursuant to paragraph (4) of Section 8.1.2, Current Operating Plan (COP) Performance Requirements, the Startup Offers and Minimum-Energy Offer from a Resource’s Three-Part Supply Offer shall not be used in the RUC process. (12) ERCOT shall create Three-Part Supply Offers for all Resources that did not submit a Three-Part Supply Offer, but are specified as available but Off-Line, excluding Resources with a Resource Status of EMR, in a QSE’s COP. For such Resources, excluding available Off-Line Resources with a cold start time of one hour or less that have not been removed from special consideration under paragraph (15) below pursuant to paragraph (4) of Section 8.1.2, ERCOT shall use in the RUC process 100% of any approved verifiable Startup Cost and verifiable minimum-energy cost or if verifiable costs have not been approved, the applicable Resource Category Generic Startup Offer Cost and the applicable Resource Category Generic Minimum-Energy Offer Cost as described specified in Section 4.4.9.2.3, Startup Offer and Minimum-Energy Offer Generic Caps, registered with ERCOT. Also, for Settlement purposes, ERCOT shall use any approved verifiable Startup Costs and verifiable minimum-energy cost for such Resources, or if verifiable costs have not been approved, the applicable Resource Category Generic Startup Offer Cost and Generic Minimum-Energy Offer Cost.(13) A QSE shall notify the ERCOT Operator of any physical limitation that impacts its Resource’s ability to start that is not reflected in the Resource’s COP or the Resource’s startup time, minimum On-Line time, or minimum Off-Line time. The following shall apply:(a) If a Resource receives a RUC Dispatch Instruction that it cannot meet due to a physical limitation described in paragraph (5) above, the QSE representing the Resource shall notify the ERCOT Operator of the inability to fully comply with the instruction and shall comply with the instruction to the best of the Resource’s ability. If the QSE has provided the ERCOT Operator notice of that limitation at least seven days prior to the Operating Day in which the instruction occurs, the QSE shall be excused from complying with the portion of the RUC Dispatch Instruction that it could not meet due to the identified limitation. (b) If a QSE provides notice pursuant to paragraph (a) above of a physical limitation that will delay the RUC-committed Resource’s ability to reach its LSL in accordance with a RUC Dispatch Instruction, ERCOT shall extend the RUC Dispatch Instruction so that the Resource’s minimum run time is respected. However, if the Resource will not be available in time to address the issue for which it received the RUC instruction, ERCOT may instead cancel the RUC Dispatch Instruction.(14) A QSE shall be excused from complying with any portion of a RUC Dispatch Instruction that it could not meet due to a physical limitation that was reflected, at the time of the RUC Dispatch Instruction, in the Resource’s COP, startup time, minimum On-Line time, or minimum Off-Line time.(15) To determine the projected energy output level of each Resource and to project potential congestion patterns for each hour of the RUC, ERCOT shall calculate proxy Energy Offer Curves based on the Mitigated Offer Caps (MOCs) for the type of Resource as specified in Section 4.4.9.4, Mitigated Offer Cap and Mitigated Offer Floor, for use in the RUC. Proxy Energy Offer Curves are calculated by multiplying the MOC by a constant selected by ERCOT from time to time that is no more than 0.10% and applying the cost for all Generation Resource output between High Sustained Limit (HSL) and LSL. The intent of this process is to minimize the effect of the proxy Energy Offer Curves on optimization. For ESRs, energy dispatch costs are not considered in determining projected energy output levels.(16) ERCOT shall calculate proxy Ancillary Service Offer Curves for use in RUC based on validated Ancillary Service Offers as specified in Section 4.4.7.2, Ancillary Service Offers. For all Resources that do not have a valid Ancillary Service Offer but are qualified to provide an Ancillary Service, ERCOT shall create an Ancillary Service Offer Curve for use in RUC as described in Section 6.5.7.3, Security Constrained Economic Dispatch. Proxy Ancillary Service Offer Curves for use in RUC are calculated by multiplying the Ancillary Service Offer by a constant selected by ERCOT from time to time that is no more than 0.1%, and are extended between the HSL and LSL. Notwithstanding the presence or absence of a proxy Ancillary Service Offer, Ancillary Service provision in RUC shall be limited by the Resource’s Ancillary Service capabilities as reflected in the COP. For ESRs, Ancillary Service Offer costs are not considered in determining projected Ancillary Service awards.(17) For all available Off-Line Resources having a cold start time of one hour or less and not removed from special consideration pursuant to paragraph (4) of Section 8.1.2, ERCOT shall scale any approved verifiable Startup Cost and verifiable minimum-energy cost or if verifiable costs have not been approved, the applicable Resource Category Generic Startup Offer Cost and the applicable Resource Category Generic Minimum-Energy Offer Cost as specified in Section 4.4.9.2.3 for use in the RUC process. The above parameter is defined as follows:

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Current Value\*** |
| 1HRLESSCOSTSCALING | Percentage | Maximum value of 100% |
| \* The current value for the parameter(s) referenced in this table above will be recommended by the Technical Advisory Committee (TAC) and the ERCOT Board and approved by the Public Utility Commission of Texas (PUCT). ERCOT shall update parameter value(s) on the first day of the month following PUCT approval unless otherwise directed. ERCOT shall provide a Market Notice prior to implementation of a revised parameter value. |

(18) Factors included in the RUC process are: (a) ERCOT System-wide hourly Load forecast allocated appropriately over Load buses;(b) ERCOT’s Ancillary Service Plans in the form of ASDCs;(c) Transmission constraints – Transfer limits on energy flows through the electricity network;(i) Thermal constraints – protect transmission facilities against thermal overload;(ii) Generic constraints – protect the transmission system against transient instability, dynamic instability or voltage collapse;(d) Planned transmission topology;(e) Energy sufficiency constraints, including RUC duration requirements for energy and Ancillary Services;(f) Inputs from the COP, as appropriate;(g) Inputs from Resource Parameters, including a list of Off-Line Available Resources having a start-up time of one hour or less, as appropriate;(h) Each Generation Resource’s Minimum-Energy Offer and Startup Offer, from its Three-Part Supply Offer;(i) Any Generation Resource that is Off-Line and available but does not have a Three-Part Supply Offer;(j) Forced Outage information;(k) Inputs from the eight-day look ahead planning tool, which may potentially keep a unit On-Line (or start a unit for the next day) so that a unit minimum duration between starts does not limit the availability of the unit (for security reasons); and(l) Ancillary Service Deployment Factors. (19) The HRUC process and the DRUC process are as follows:(a) The HRUC process uses current Resource Status for the initial condition for the first hour of the RUC Study Period. All HRUC processes use the projected status of transmission breakers and switches starting with current status and updated for each remaining hour in the study as indicated in the COP for Resources and in the Outage Scheduler for transmission elements. (b) The DRUC process uses the current hourly forecast of total ERCOT Load including DC Tie Schedules up to the physical rating of the DC Tie for each hour of the Operating Day. The HRUC process uses the current hourly forecast of total ERCOT Load including DC Tie Schedules up to the physical rating of the DC Tie for each hour in the RUC Study Period.(c) The DRUC process uses the Day-Ahead weather forecast for each hour of the Operating Day. The HRUC process uses the weather forecast information for each hour of the balance of the RUC Study Period.(d) For the HRUC, DRUC, and Weekly Reliability Unit Commitment (WRUC) processes, a feasibility check on the COP submitted Hour Beginning Planned SOC will be performed. This check may adjust the Hour Beginning Planned SOC used in the RUC process. The feasibility check looks sequentially across all intervals in the RUC Study Period to validate whether a particular interval’s COP Hour Beginning Planned SOC is achievable from the previous interval. If it is not feasible, then RUC will adjust the Hour Beginning Planned SOC to the closest achievable value.(20) A QSE with a Resource that is not a Reliability Must-Run (RMR) Unit or has not received an Outage Schedule Adjustment (OSA) that has been committed in a DRUC or HRUC process may opt out of the RUC Settlement (or “buy back” the commitment) by setting the COP status of the RUC-committed Resource to ONOPTOUT for the first hour of a contiguous block of RUC-Committed Hours in the Opt Out Snapshot. All the configurations of the same Combined Cycle Train shall be treated as the same Resource for the purpose of creating the block of RUC-Committed Hours. A RUC-committed Combined Cycle Generation Resource may opt out of the RUC Settlement by setting the COP status of any Combined Cycle Generation Resource within the same Combined Cycle Train as the RUC-committed Resource to ONOPTOUT for the first hour of a contiguous block of RUC-Committed Hours in the Opt Out Snapshot. A Combined Cycle Generation Resource that is RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity may opt out of the RUC Settlement following the same rule for RUC-committed Combined Cycle Generation Resources described above. A QSE that opts out of RUC Settlement forfeits RUC Settlement for the affected Resource for a given block of RUC Buy-Back Hours. A QSE that opts out of RUC Settlement treatment must make the Resource available to SCED for all RUC Buy-Back Hours. All hours in a contiguous block of RUC-Committed Hours that includes the RUC Buy-Back Hour shall be considered RUC Buy-Back Hours. If a contiguous block of RUC-Committed Hours spans more than one Operating Day and a QSE wishes to opt out of RUC Settlement for the RUC-Committed Hours in the second or subsequent Operating Day, the QSE must set its COP status to ONOPTOUT for the first hour of that the first Operating Day in the Opt Out Snapshot of the first Operating Day.(21) ERCOT shall, as soon as practicable, post to the ERCOT website a report identifying those hours that were considered RUC Buy-Back Hours, along with the name of each RUC-committed Resource whose QSE opted out of RUC Settlement.(22) A Resource that has a Three-Part Supply Offer cleared in the Day-Ahead Market (DAM) and subsequently receives a RUC commitment for the Operating Hour for which it was awarded will be treated as if the Resource Status was ONOPTOUT for purposes of Section 6.5.7.3 and Section 6.5.7.3.1, Determination of Real-Time Reliability Deployment Price Adders.(23) A Resource that has self-committed for an Operating Hour after the RUC Snapshot was taken but before the RUC commitment has been communicated through an XML message for that RUC process and that Operating Hour is included in a block of RUC-committed hours for that RUC process will be treated as if the Resource Status was ONOPTOUT for purposes of Section 6.5.7.3, Section 6.5.7.3.1, and RUC Settlement for the entire block of RUC-committed hours. A QSE that has a Resource that meets these conditions must make the Resource available to SCED for the entire block of RUC-committed hours. ERCOT will send the QSE a notification stating the Operating Day and block of hours for which this occurred. |

**6.5.7.3 Security Constrained Economic Dispatch**

(1) The SCED process is designed to simultaneously manage energy, the system power balance and network congestion through Resource Base Points and calculation of LMPs every five minutes. The SCED process uses a two-step methodology that applies mitigation prospectively to resolve Non-Competitive Constraints for the current Operating Hour. The SCED process evaluates Energy Offer Curves, Output Schedules and Real-Time Market (RTM) Energy Bids to determine Resource Dispatch Instructions by maximizing bid-based revenues minus offer-based costs, subject to power balance and network constraints. The SCED process uses the Resource Status provided by SCADA telemetry under Section 6.5.5.2, Operational Data Requirements, and validated by the Real-Time Sequence, instead of the Resource Status provided by the COP.

(2) The SCED solution must monitor cumulative deployment of Regulation Services and ensure that Regulation Services deployment is minimized over time.

(3) In the Generation To Be Dispatched (GTBD) determined by LFC, ERCOT shall subtract the sum of the telemetered net real power consumption from all CLRs available to SCED.

(4) For use as SCED inputs, ERCOT shall use the available capacity of all committed Generation Resources by creating proxy Energy Offer Curves for certain Resources as follows:

(a) Non-IRRs and Dynamically Scheduled Resources (DSRs) without Energy Offer Curves

(i) ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below for:

(A) Each non-IRR for which its QSE has submitted an Output Schedule instead of an Energy Offer Curve; and

(B) Each DSR that has not submitted incremental and decremental Energy Offer Curves.

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL | SWCAP |
| Output Schedule MW plus 1 MW | SWCAP minus $0.01 |
| Output Schedule MW | -$249.99 |
| LSL | -$250.00 |

(b) DSRs with Energy Offer Curves

(i) For each DSR that has submitted incremental and decremental Energy Offer Curves, ERCOT shall create a monotonically increasing proxy Energy Offer Curve. That curve must consist of the incremental Energy Offer Curve that reflects the available capacity above the Resource’s Output Schedule to its HSL and the decremental Energy Offer Curve that reflects the available capacity below the Resource’s Output Schedule to the LSL. The curve must be created as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| Output Schedule MW plus 1 MW to HSL | Incremental Energy Offer Curve |
| LSL to Output Schedule MW  | Decremental Energy Offer Curve |

(c) Non-IRRs without full-range Energy Offer Curves

(i) For each non-IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the Resource’s available capacity, ERCOT shall create a proxy Energy Offer Curve that extends the submitted Energy Offer Curve to use the entire available capacity of the Resource above the highest point on the Energy Offer Curve to the Resource’s HSL and the offer floor from the lowest point on the Energy Offer Curve to its LSL, using these points:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in submitted Energy Offer Curve) | Price associated with highest MW in submitted Energy Offer Curve |
| Energy Offer Curve | Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(d) IRRs

(i) For each IRR that has not submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL | $1,500 |
| HSL minus 1 MW | -$249.99 |
| LSL | -$250.00 |

(ii) For each IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the IRR’s available capacity, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in submitted Energy Offer Curve) | Price associated with the highest MW in submitted Energy Offer Curve |
| Energy Offer Curve | Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(e) RUC-committed Resources

(i) For each RUC-committed Resource that has not submitted an Energy Offer Curve, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL  | $250 |
| Zero | $250 |

(ii) For each RUC-committed Resource that has submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in Energy Offer Curve) | Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve |
| Energy Offer Curve | Greater of $250 or the QSE submitted Energy Offer Curve |
| Zero | Greater of $250 or the first price point of the QSE submitted Energy Offer Curve |

(iii) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has not submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL of RUC-committed configuration  | $250 |
| Zero | $250 |

(iv) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL of RUC-committed configuration (if more than highest MW in Energy Offer Curve) | Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve |
| Energy Offer Curve for MW at and above HSL of QSE-committed configuration | Greater of $250 or the QSE submitted Energy Offer Curve |
| HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve and price associated with highest MW in Energy Offer Curve is less than $250) | $250 |
| HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve) | Price associated with the highest MW in QSE submitted Energy Offer Curve |
| Energy Offer Curve for MW at and below HSL of QSE-committed configuration | The QSE submitted Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(5) The Entity with decision making authority, as more fully described in Section 3.19.1, Constraint Competitiveness Test Definitions, over how a Resource or Split Generation Resource is offered or scheduled, shall be responsible for all offers associated with each Resource, including offers represented by a proxy Energy Offer Curve.

(6) For a CLR whose QSE has submitted an RTM Energy Bid that does not cover the full range of the Resource’s available Demand response capability, consistent with the CLR’s telemetered quantities, ERCOT shall create a proxy energy bid as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| LPC to MPC minus maximum MW of RTM Energy Bid | Price associated with the lowest MW in submitted RTM Energy Bid curve |
| MPC minus maximum MW of RTM Energy Bid to MPC | RTM Energy Bid curve |
| MPC | Right-most point (lowest price) on RTM Energy Bid curve |

(7) ERCOT shall ensure that any RTM Energy Bid is monotonically non-increasing. The QSE representing the CLR shall be responsible for all RTM Energy Bids, including bids updated by ERCOT as described above.

(8) If a CLR telemeters a status of OUTL, it is not considered as dispatchable capacity by SCED. A QSE may use this function to inform ERCOT of instances when the CLR is unable to follow SCED Dispatch Instructions. Under all telemetered statuses including OUTL, the remaining telemetry quantities submitted by the QSE shall represent the operating conditions of the CLR that can be verified by ERCOT. A QSE representing a CLR with a telemetered status of OUTL is still obligated to provide any applicable Ancillary Service Resource Responsibilities previously awarded to that CLR. This paragraph does not apply to ESRs.

(9) Energy Offer Curves that were constructed in whole or in part with proxy Energy Offer Curves shall be so marked in all ERCOT postings or references to the energy offer.

(10) The two-step SCED methodology referenced in paragraph (1) above is:

(a) The first step is to execute the SCED process to determine Reference LMPs. In this step, ERCOT executes SCED using the full Network Operations Model while only observing limits of Competitive Constraints. Energy Offer Curves for all On-Line Generation Resources and RTM Energy Bids from available CLRs, whether submitted by QSEs or created by ERCOT under this Section, are used in the SCED to determine “Reference LMPs.”

(b) The second step is to execute the SCED process to produce Base Points, Shadow Prices, and LMPs, subject to security constraints (including Competitive and Non-Competitive Constraints) and other Resource constraints. The second step must:

(i) Use Energy Offer Curves for all On-Line Generation Resources, whether submitted by QSEs or created by ERCOT. Each Energy Offer Curve must be bounded at the lesser of the Reference LMP (from Step 1) or the appropriate Mitigated Offer Floor. In addition, each Energy Offer Curve subject to mitigation under the criteria described in Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, must be capped at the greater of the Reference LMP (from Step 1) at the Resource Node plus a variable not to exceed 0.01 multiplied by the value of the Resource’s Mitigated Offer Cap (MOC) curve at the LSL or the appropriate MOC;

(ii) Use RTM Energy Bid curves for all available CLRs, whether submitted by QSEs or created by ERCOT. There is no mitigation of RTM Energy Bids. An RTM Energy Bid from a CLR represents the bid for energy distributed across all nodes in the Load Zone in which the CLR is located. For an ESR, an RTM Energy Bid represents a bid for energy at the ESR’s Resource Node; and

(iii) Observe all Competitive and Non-Competitive Constraints.

(c) ERCOT shall archive information and provide monthly summaries of security violations and any binding transmission constraints identified in Step 2 of the SCED process. The summary must describe the limiting element (or identified operator-entered constraint with operator’s comments describing the reason and the Resource-specific impacts for any manual overrides). ERCOT shall provide the summary to Market Participants on the MIS Secure Area and to the Independent Market Monitor (IMM).

(11) For each SCED process, in addition to the binding Base Points and LMPs, ERCOT shall calculate a non-binding projection of the Base Points and Resource Node LMPs, Real-Time Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders, Hub LMPs and Load Zone LMPs at a frequency of every five minutes for at least 15 minutes into the future based on the same inputs to the SCED process as described in this Section, except that the Resource’s HDL and LDL and the total generation requirement will be as estimated at future intervals. The Resource’s HDL and LDL will be calculated for each interval of the projection based on the ramp rate capability over the study period. ERCOT shall estimate the projected total generation requirement by calculating a Load forecast for the study period. In lieu of the steps described in Section 6.5.7.3.1, Determination of Real-Time On-Line Reliability Deployment Price Adder, the non-binding projection of Real-Time Reliability Deployment Price Adders shall be estimated based on GTBD, reliability deployments MWs, and aggregated offers. The Energy Offer Curve from SCED Step 2, the virtual offers for Load Resources deployed and the power balance penalty curve will be compared against the updated GTBD to get an estimate of the System Lambda from paragraph (2)(m) of Section 6.5.7.3.1. ERCOT shall post the projected non-binding Base Points for each Resource for each interval study period on the MIS Certified Area and the projected non-binding LMPs for Resource Nodes, Real-Time Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders, Hub LMPs and Load Zone LMPs on the ERCOT website pursuant to Section 6.3.2, Activities for Real-Time Operations.

(12) For each SCED process, ERCOT shall calculate a Real-Time On-Line Reserve Price Adder and a Real-Time Off-Line Reserve Price Adder based on the On-Line and Off-Line available reserves in the ERCOT System and the Operating Reserve Demand Curve (ORDC). The Real-Time Off-Line available reserves shall be administratively set to zero when the SCED snapshot of the Physical Responsive Capability (PRC) is equal to or below the PRC MW at which Energy Emergency Alert (EEA) Level 1 is initiated. In addition, for each SCED process, ERCOT shall calculate a Real-Time On-Line Reliability Deployment Price Adder. The sum of the Real-Time Reliability Deployment Price Adder and the Real-Time On-Line Reserve Price Adder shall be averaged over the 15-minute Settlement Interval and added to the Real-Time LMPs to determine the Real-Time Settlement Point Prices. The price after the addition of the sum of the Real-Time On-Line Reliability Deployment Price Adder and the Real-Time On-Line Reserve Price Adder to LMPs approximates the pricing outcome of the impact to energy prices from reliability deployments and the Real-Time energy and Ancillary Service co-optimization since the Real-Time On-Line Reserve Price Adder captures the value of the opportunity cost of reserves based on the defined ORDC. An Ancillary Service imbalance Settlement shall be performed pursuant to Section 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge, to make Resources indifferent to the utilization of their capacity for energy or Ancillary Service reserves.

(13) ERCOT shall determine the methodology for implementing the ORDC to calculate the Real-Time On-Line Reserve Price Adder and Real-Time Off-Line Reserve Price Adder. Following review by TAC, the ERCOT Board shall review the recommendation and approve a final methodology. Within two Business Days following approval by the ERCOT Board, ERCOT shall post the methodology on the ERCOT website.

(14) At the end of each season, ERCOT shall determine the ORDC for the same season in the upcoming year, based on historic data using the ERCOT Board-approved methodology for implementing the ORDC. Annually, ERCOT shall verify that the ORDC is adequately representative of the loss of Load probability for varying levels of reserves. Twenty days after the end of the Season, ERCOT shall post the ORDC for the same season of the upcoming year on the ERCOT website.

(15) ERCOT may override one or more of a CLR’s parameters in SCED if ERCOT determines that the CLR’s participation is having an adverse impact on the reliability of the ERCOT System.

(16) The QSE representing an ESR, in order to charge the ESR, must submit RTM Energy Bids, and the ESR may withdraw energy from the ERCOT System only when dispatched by SCED to do so. An ESR may telemeter a status of OUTL only if the ESR is in Outage status.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| ***[NPRR930, NPRR1000, NPRR1010, NPRR1014, NPRR1019, NPRR1188, and NPRR1204: Replace applicable portions of Section 6.5.7.3 above with the following upon system implementation for NPRR930, NPRR1000, NPRR1014, NPRR1019, or NPRR1188; or upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1010 and NPRR1204:]*****6.5.7.3 Security Constrained Economic Dispatch**(1) The SCED process is designed to simultaneously manage energy, Ancillary Services, the system power balance and network congestion through Resource Base Points, Ancillary Service awards, and the calculation of LMPs and Real-Time MCPCs approximately every five minutes, or more frequently if necessary. The SCED process uses a two-step methodology that applies mitigation to offers for energy prospectively to resolve Non-Competitive Constraints for the current Operating Hour. The SCED process evaluates Energy Offer Curves, Energy Bid/Offer Curves, Ancillary Service Offers, Output Schedules, and Energy Bid Curves to determine Resource Dispatch Instructions and Ancillary Service awards by maximizing bid-based revenues minus offer-based costs, subject to power balance, Ancillary Service Demand Curves (ASDCs), and network constraints. The SCED process uses the Resource Status provided by SCADA telemetry under Section 6.5.5.2, Operational Data Requirements, and validated by the Real-Time Sequence, instead of the Resource Status provided by the COP. In addition, the SCED process accounts for each ESR’s State of Charge (SOC) and SOC operating limits. This is to ensure that the SCED process will issue ESR Base Points and Ancillary Services that are feasible taking into account SCED duration requirements for energy and Ancillary Services and also that do not violate the ESR’s Minimum State of Charge (MinSOC) and Maximum State of Charge (MaxSOC) limits.(2) The SCED solution must monitor cumulative deployment of Regulation Services and ensure that Regulation Services deployment is minimized over time.(3) In the Generation To Be Dispatched (GTBD) determined by LFC, ERCOT shall subtract the sum of the telemetered net real power consumption from all CLRs available to SCED.(4) For use as SCED inputs for determining energy dispatch and Ancillary Service awards, ERCOT shall use the available capacity of all committed Generation Resources by creating proxy Energy Offer Curves for certain Resources as follows: (a) Non-IRRs without Energy Offer Curves(i) ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below for:(A) Each non-IRR for which its QSE has submitted an Output Schedule instead of an Energy Offer Curve.

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL | RTSWCAP |
| Output Schedule MW plus 1 MW | RTSWCAP minus $0.01 |
| Output Schedule MW | -$249.99 |
| LSL | -$250.00 |

(b) Non-IRRs without full-range Energy Offer Curves (i) For each non-IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the Resource’s available capacity, ERCOT shall create a proxy Energy Offer Curve that extends the submitted Energy Offer Curve to use the entire available capacity of the Resource above the highest point on the Energy Offer Curve to the Resource’s HSL and the offer floor from the lowest point on the Energy Offer Curve to its LSL, using these points:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in submitted Energy Offer Curve) | Price associated with highest MW in submitted Energy Offer Curve |
| Energy Offer Curve | Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(c) IRRs(i) For each IRR that has not submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL | $1,500 |
| HSL minus 1 MW | -$249.99 |
| LSL | -$250.00 |

(ii) For each IRR for which its QSE has submitted an Energy Offer Curve that does not cover the full range of the IRR’s available capacity, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in submitted Energy Offer Curve) | Price associated with the highest MW in submitted Energy Offer Curve |
| Energy Offer Curve | Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(d) RUC-committed Resources (i) For each RUC-committed Resource that has not submitted an Energy Offer Curve, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL  | $250 |
| Zero | $250 |

(ii) For each RUC-committed Resource that has submitted an Energy Offer Curve, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in Energy Offer Curve) | Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve |
| Energy Offer Curve | Greater of $250 or the QSE submitted Energy Offer Curve |
| Zero | Greater of $250 or the first price point of the QSE submitted Energy Offer Curve |

(iii) For each RUC-committed Resource during the time period stated in the Advance Action Notice (AAN) if any Resource received an Outage Schedule Adjustment, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL | $4,500 or the effective Value of Lost Load (VOLL), whichever is less. |
| Zero | $4,500 or the effective VOLL, whichever is less. |

(iv) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has not submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL of RUC-committed configuration  | $250 |
| Zero | $250 |

(v) For each Combined Cycle Generation Resource that was RUC-committed from one On-Line configuration in order to transition to a different configuration with additional capacity, as instructed by ERCOT, that has submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a monotonically increasing proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL of RUC-committed configuration (if more than highest MW in Energy Offer Curve) | Greater of $250 or price associated with the highest MW in QSE submitted Energy Offer Curve |
| Energy Offer Curve for MW at and above HSL of QSE-committed configuration | Greater of $250 or the QSE submitted Energy Offer Curve |
| HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve and price associated with highest MW in Energy Offer Curve is less than $250) | $250 |
| HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve) | Price associated with the highest MW in QSE submitted Energy Offer Curve |
| Energy Offer Curve for MW at and below HSL of QSE-committed configuration | The QSE submitted Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(vi) For each RUC-committed Switchable Generation Resource (SWGR) that is not part of a Combined Cycle Train already operating in ERCOT, that has not submitted an Energy Offer Curve, and that has a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of the RUC instruction, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL | $4,500 or the effective Value of Lost Load (VOLL), whichever is less |
| Zero | $4,500 or the effective VOLL, whichever is less |

(vii) For each RUC-committed SWGR that is not part of a Combined Cycle Train already operating in ERCOT, that has submitted an Energy Offer Curve, and that has a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of the RUC instruction, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL (if more than highest MW in Energy Offer Curve) | Greater of: $4,500 or the effective VOLL, whichever is less; and the price associated with the highest MW in QSE-submitted Energy Offer Curve |
| Energy Offer Curve | Greater of: $4,500 or the effective VOLL, whichever is less; and the QSE-submitted Energy Offer Curve |
| Zero | Greater of: $4,500 or the effective VOLL, whichever is less; and the first price point of the QSE-submitted Energy Offer Curve |

(viii) For each Combined Cycle Train configuration that includes at least one SWGR that is operating in a non-ERCOT Control Area as part of a configuration with a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of a RUC instruction requiring the switching of the SWGR into the ERCOT Control Area, if the QSE for the Combined Cycle Train has not submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL of RUC-committed configuration  | $4,500 or the effective VOLL, whichever is less |
| Zero | $4,500 or the effective VOLL, whichever is less |

(ix) For each Combined Cycle Train configuration that includes at least one SWGR that is operating in a non-ERCOT Control Area as part of a configuration with a COP Resource Status of EMRSWGR for the instructed Operating Hour at the time of a RUC instruction requiring the switching of the SWGR into the ERCOT Control Area, if the QSE for the Combined Cycle Train has submitted an Energy Offer Curve for the RUC-committed configuration, ERCOT shall create a proxy Energy Offer Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| HSL of RUC-committed configuration (if more than highest MW in Energy Offer Curve) | Greater of: $4,500 or the effective VOLL, whichever is less; and the price associated with the highest MW in QSE-submitted Energy Offer Curve |
| Energy Offer Curve for MW at and above HSL of QSE-committed configuration | Greater of: $4,500 or the effective VOLL, whichever is less; and the QSE-submitted Energy Offer Curve |
| HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve and price associated with highest MW in Energy Offer Curve is less than $4,500) | $4,500 or the effective VOLL, whichever is less |
| HSL of QSE-committed configuration (if more than highest MW in Energy Offer Curve) | Price associated with the highest MW in QSE-submitted Energy Offer Curve |
| Energy Offer Curve for MW at and below HSL of QSE-committed configuration | The QSE-submitted Energy Offer Curve |
| 1 MW below lowest MW in Energy Offer Curve (if more than LSL) | -$249.99 |
| LSL (if less than lowest MW in Energy Offer Curve) | -$250.00 |

(5) For use as SCED inputs for determining energy dispatch and Ancillary Service awards, ERCOT shall use the available Ancillary Service MW capacity of all Resources by creating a proxy Ancillary Service Offer for qualified Resources as follows:(a) The proxy Ancillary Service Offer shall be a linked Ancillary Service Offer across all Ancillary Service products for which a Resource is qualified to provide. For Generation Resources, the proxy Ancillary Service Offer MW shall be equal to the Resource’s telemetered HSL. For ESRs, the proxy Ancillary Service Offer MW shall be equal to the difference between the Resource’s telemetered HSL and LSL. For Load Resources, the proxy Ancillary Service Offer MW shall be equal to the Resource’s telemetered Maximum Power Consumption (MPC).(b) For Resources that are not RUC-committed, the price in the proxy Ancillary Service Offer shall be set to:(i) For Reg-Up and RRS, the maximum of:(A) The proxy Ancillary Service Offer price floor for Reg-Up or RRS, respectively;(B) The Resource’s highest submitted Ancillary Service Offer price for Reg-Up or RRS, respectively;(C) The Resource’s highest Ancillary Service Offer price for ECRS (submitted or proxy); or(D) The Resource’s highest Ancillary Service Offer price for Non-Spin (submitted or proxy).(ii) For ECRS, the maximum of: (A) The proxy Ancillary Service Offer price floor for ECRS; (B) The Resource’s highest submitted Ancillary Service Offer price for ECRS; or(C) The Resource’s highest Ancillary Service Offer price for Non-Spin (submitted or proxy).(iii) For Non-Spin, the maximum of: (A) The proxy Ancillary Service Offer price floor for Non-Spin; or(B) The Resource’s highest submitted Ancillary Service Offer price for Non-Spin.(iv) For Reg-Down, the maximum of:(A) The proxy Ancillary Service Offer price floor for Reg-Down; or(B) The Resource’s highest submitted Ancillary Service Offer price for Reg-Down.(c) The proxy Ancillary Service Offer price floors for each SCED-interval shall be derived from the effective ASDCs and Ancillary Service Plan using the following logic:(i) The proxy Ancillary Service Offer price floor for Reg-Up is equal to the lesser of the values below minus $0.01 per MW per hour:(A) $2,000 per MW per hour; or (B) The point on the ASDC for Reg-Up that intersects with a quantity that is 95% of the Ancillary Service Plan for Reg-Up.(ii) The proxy Ancillary Service Offer price floor for RRS is equal to the lesser of the values below minus $0.01 per MW per hour:(A) $2,000 per MW per hour; or (B) The point on the ASDC for RRS that intersects with a quantity that is 95% of the Ancillary Service Plan for RRS.(iii) The proxy Ancillary Service Offer price floor for ECRS is equal to the lesser of the values below minus $0.01 per MW per hour:(A) $2,000 per MW per hour; or (B) The point on the ASDC for ECRS that intersects with a quantity that is 95% of the Ancillary Service Plan for ECRS.(iv) The proxy Ancillary Service Offer price floor for Non-Spin is equal to the lesser of the values below minus $0.01 per MW per hour:(A) $2,000 per MW per hour; or (B) The point on the ASDC for Non-Spin that intersects with a quantity that is 95% of the Ancillary Service Plan for Non-Spin.(v) The proxy Ancillary Service Offer price floor for Reg-Down is equal to the lesser of the values below minus $0.01 per MW per hour:(A) $2,000 per MW per hour; or (B) The point on the ASDC for Reg-Down that intersects with a quantity that is 95% of the Ancillary Service Plan for Reg-Down.(d) ERCOT systems shall be designed to allow for proxy Ancillary Service Offer price floors to differ when the same Ancillary Service product can be provided by either On-Line or Off-Line Resources, and/or an Ancillary Service product has sub-types. (e) For RUC-committed Resources:(i) If a RUC-committed Resource does not have an Ancillary Service Offer for an Ancillary Service product that the Resource is qualified to provide, ERCOT shall create an Ancillary Service Offer for that Ancillary Service product at a value of $250 per MWh for the full operating range of the Resource up to its telemetered HSL.(ii) For each Ancillary Service product for which a RUC-committed Resource has an Ancillary Service Offer, the Ancillary Service Offer used by SCED for that Ancillary Service product across the full operating range of the Resource up to its telemetered HSL shall be the maximum of: (A) The Resource’s highest submitted Ancillary Service Offer price; or (B) $250 per MWh.(6) For use as SCED inputs for determining energy Dispatch and Ancillary Service awards, ERCOT shall use the available capacity of all On-Line ESRs by creating proxy Energy Bid/Offer Curves for certain Resources as follows: (a) For each ESR for which its QSE has submitted an Energy Bid/Offer Curve that does not cover the full offer range (LSL to HSL) of the Resource’s available capacity, ERCOT shall create a proxy Energy Bid/Offer Curve that extends the submitted Energy Bid/Offer Curve to use the entire available capacity of the Resource above the highest MW point on the Energy Bid/Offer Curve to the Resource’s HSL and from the lowest MW point on the Energy Bid/Offer Curve to LSL, using these prices for the corresponding MW segments:

|  |  |  |
| --- | --- | --- |
| **Scenario** | **MW Segment** | **Price (per MWh)** |
| HSL MW and the highest MW point on the Energy Bid/Offer are both greater than or equal to zero, and,HSL is greater than the highest MW in submitted Energy Bid/Offer Curve | From highest MW point on submitted Energy Bid/Offer Curve to HSL MW | RTSWCAP  |
| HSL MW is greater than or equal to zero, and,the highest MW point on the Energy Bid/Offer is less than zero | From highest MW point on submitted Energy Bid/Offer Curve to 0 MWFrom 0 MW to HSL | Price associated with the highest MW in submitted Energy Bid/Offer CurveRTSWCAP |
| HSL is less than zero and is also greater than the highest MW in submitted Energy Bid/Offer Curve | From highest MW point on submitted Energy Bid/Offer Curve to HSL MW | Price associated with the highest MW in submitted Energy Bid/Offer Curve |
| Energy Bid/Offer Curve |  | Energy Bid/Offer Curve |
| LSL MW and the lowest MW point on the Energy Bid/Offer Curve are both greater than or equal to zero, and,LSL is less than the lowest MW in submitted Energy Bid/Offer Curve | From LSL to lowest MW point on submitted Energy Bid/Offer Curve | Price associated with the lowest MW in submitted Energy Bid/Offer Curve |
| LSL MW is less than zero,and,the lowest MW point on the Energy Bid/Offer Curve is greater than zero | From LSL to 0 MWFrom 0 MW to lowest MW point on submitted Energy Bid/Offer Curve | -$250.00Price associated with the lowest MW in submitted Energy Bid/Offer Curve |
| LSL and the lowest MW point on the Energy Bid/Offer Curve are both less than or equal to zero,and,LSL is less than the lowest MW point on the Energy Bid/Offer Curve | From LSL to lowest MW point on submitted Energy Bid/Offer Curve | -$250.00 |

(b) At the time of SCED execution, if a valid Energy Bid/Offer Curve or Output Schedule does not exist for an ESR that has a status of On-Line, then ERCOT shall notify the QSE and create a proxy Energy Bid/Offer Curve priced at -$250/MWh for the MW portion of the curve less than zero MW, and priced at the RTSWCAP for the MW portion of the curve greater than zero MW.(c) At the time of SCED execution, if a QSE representing an ESR has submitted an Output Schedule instead of an Energy Bid/Offer Curve, ERCOT shall create a proxy Energy Bid/Offer Curve priced at -$250 per MWh for the MW portion of the curve from its LSL to the MW amount on the Output Schedule, and priced at the RTSWCAP for the MW portion of the curve from the MW amount on the Output Schedule to its HSL.(7) The Entity with decision-making authority, as more fully described in Section 3.19.1, Constraint Competitiveness Test Definitions, over how a Resource or Split Generation Resource is offered or scheduled, shall be responsible for all offers associated with each Resource, including offers represented by a proxy Energy Offer Curve, proxy Energy Bid/Offer Curve, or proxy Ancillary Service Offer. (8) For a CLR whose QSE has submitted an Energy Bid Curve that does not cover the full range of the Resource’s available Demand response capability, consistent with the CLR’s telemetered quantities, ERCOT shall create a proxy energy bid as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| LPC to MPC minus maximum MW of Energy Bid Curve | Price associated with the lowest MW in submitted Energy Bid Curve |
| MPC minus maximum MW of Energy Bid Curve to MPC | Energy Bid Curve |
| MPC | Right-most point (lowest price) on Energy Bid Curve |

(9) For a CLR whose QSE has not submitted an Energy Bid Curve, consistent with the CLR’s telemetered quantities, ERCOT shall create a proxy Energy Bid Curve as described below:

|  |  |
| --- | --- |
| **MW** | **Price (per MWh)** |
| LPC to MPC  | SWCAP |

(10) ERCOT shall ensure that any Energy Bid Curve is monotonically non-increasing. The QSE representing the CLR shall be responsible for all Energy Bid Curves, including Energy Bid Curves updated by ERCOT as described above.(11) A CLR may consume energy only when dispatched by SCED to do so. A CLR may telemeter a status of OUTL only if the Resource is Off-Line and unavailable with its energy consumption at zero. In instances when the CLR is unable to follow SCED Dispatch Instructions but still consumes energy, the CLR must submit a Resource Status of ONHOLD. Under all telemetered statuses, including OUTL, the remaining telemetry quantities submitted by the QSE shall represent the operating conditions of the CLR that can be verified by ERCOT. A QSE representing a CLR with a telemetered status of OUTL or ONHOLD is still obligated to provide any applicable Ancillary Services awarded to the Resource. This paragraph does not apply to ESRs. (12) Energy Offer Curves that were constructed in whole or in part with proxy Energy Offer Curves shall be so marked in all ERCOT postings or references to the energy offer.(13) SCED will enforce Resource-specific Ancillary Service constraints to ensure that Ancillary Service awards are aligned with a Resource’s qualifications and telemetered Ancillary Service capabilities.(a) A scaling factor of 5/7 shall be used for Reg-Up award when ensuring that the SCED Base Point plus the product of this scaling factor and the Reg-Up award does not exceed HDL.(b) A scaling factor of 5/7 shall be used for Reg-Down award when ensuring that the SCED Base Point minus the product of this scaling factor and the Reg-Down award does not go below LDL.(14) Energy Bid/Offer Curves that were constructed in whole or in part with proxy Energy Bid/Offer Curves shall be so marked in all ERCOT postings or references to the energy bid/offer.(15) The two-step SCED methodology referenced in paragraph (1) above is:(a) The first step is to execute the SCED process to determine Reference LMPs. In this step, ERCOT executes SCED using the full Network Operations Model while only observing limits of Competitive Constraints in addition to power balance and Ancillary Service constraints. Energy Offer Curves for all On-Line Generation Resources, Energy Bid/Offer Curves for all On-Line ESRs, and Energy Bid Curves from available CLRs, whether submitted by QSEs or created by ERCOT under this Section, are used in the SCED to determine “Reference LMPs.” (b) The second step is to execute the SCED process to produce Base Points, Ancillary Service awards, Shadow Prices, Real-Time MCPCs, and LMPs, subject to security constraints (including Competitive and Non-Competitive Constraints) and other Resource constraints. The second step must:(i) Use Energy Offer Curves for all On-Line Generation Resources, whether submitted by QSEs or created by ERCOT. Each Energy Offer Curve must be bounded at the lesser of the Reference LMP (from Step 1) or the appropriate Mitigated Offer Floor. In addition, each Energy Offer Curve subject to mitigation under the criteria described in Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, must be capped at the greater of the Reference LMP (from Step 1) at the Resource Node plus a variable not to exceed 0.01 multiplied by the value of the Resource’s Mitigated Offer Cap (MOC) curve at the LSL or the appropriate MOC; (ii) Use Energy Bid/Offer Curves for all On-Line ESRs, whether submitted by QSEs or created by ERCOT. Each Energy Bid/Offer Curve must be bounded at the lesser of the Reference LMP (from Step 1) or the appropriate Mitigated Offer Floor. The offer portion of each Energy Bid/Offer Curve subject to mitigation under the criteria described in Section 3.19.4, Security-Constrained Economic Dispatch Constraint Competitiveness Test, must be capped at the greater of the Reference LMP (from Step 1) at the Resource Node plus a variable not to exceed 0.01 multiplied by the value of the Resource’s MOC curve at the LSL or the appropriate MOC; (iii) Use Energy Bid Curves for all available CLRs, whether submitted by QSEs or created by ERCOT. There is no mitigation of Energy Bid Curves. An Energy Bid Curve from an Aggregate Load Resource (ALR) represents the bid for energy distributed across all nodes in the Load Zone in which the ALR is located. For an ESR or a CLR that is not an ALR, an Energy Bid Curve represents a bid for energy at the applicable Resource Node; (iv) Observe all Competitive and Non-Competitive Constraints; and(v) Use Ancillary Service Offers to determine Ancillary Service awards.(c) ERCOT shall archive information and provide monthly summaries of security violations and any binding transmission constraints identified in Step 2 of the SCED process. The summary must describe the limiting element (or identified operator-entered constraint with operator’s comments describing the reason and the Resource-specific impacts for any manual overrides). ERCOT shall provide the summary to Market Participants on the MIS Secure Area and to the Independent Market Monitor (IMM).(d) The System Lambda used to determine LMPs from SCED Step 2 shall be capped at the effective VOLL. (16) For each SCED process, in addition to the binding Base Points, Ancillary Service awards, Real-Time MCPCs, and LMPs, ERCOT shall calculate a non-binding projection of the Base Points, Ancillary Service awards, MCPCs, Resource Node LMPs, Real-Time Reliability Deployment Price Adders, Hub LMPs, and Load Zone LMPs at a frequency of every five minutes for at least 15 minutes into the future based on the same inputs to the SCED process as described in this Section, except that the Resource’s HDL and LDL and the total generation requirement will be as estimated at future intervals. The Resource’s HDL and LDL will be calculated for each interval of the projection based on the ramp rate capability over the study period. ERCOT shall estimate the projected total generation requirement by calculating a Load forecast for the study period. In lieu of the steps described in Section 6.5.7.3.1, Determination of Real-Time Reliability Deployment Price Adders, the non-binding projection of Real-Time Reliability Deployment Price Adders shall be estimated based on GTBD, reliability deployments MWs, and aggregated offers. The Energy Offer Curve and Energy Bid/Offer Curves from SCED Step 2, the virtual offers for Load Resources deployed and the power balance penalty curve will be compared against the updated GTBD to get an estimate of the System Lambda from paragraph (2)(m) of Section 6.5.7.3.1. ERCOT shall post the projected non-binding Base Points and Ancillary Service awards for each Resource for each interval study period on the MIS Certified Area and the projected non-binding LMPs for Resource Nodes, Real-Time MCPCs, Real-Time Reliability Deployment Price Adders, Hub LMPs and Load Zone LMPs on the ERCOT website pursuant to Section 6.3.2, Activities for Real-Time Operations.(17) ERCOT may override one or more of a CLR’s parameters in SCED if ERCOT determines that the CLR’s participation is having an adverse impact on the reliability of the ERCOT System.(18) The QSE representing an ESR may withdraw energy from the ERCOT System only when dispatched by SCED to do so. An ESR may telemeter a status of OUT only if the ESR is in Outage status. |