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| NPRR Number | [1224](https://www.ercot.com/mktrules/issues/NPRR1224) | NPRR Title | ECRS Manual Deployment Triggers |
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| Date | | June 4, 2024 | |
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| Cell Number | | 603-481-6390 | |
| Market Segment | | Not applicable | |

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| Comments |

Potomac Economics, serving as the Independent Market Monitor (IMM), submits the following comments regarding the current proposal for deployment of ERCOT Contingency Reserve Service (ECRS).

The current proposal specifies deployment of ECRS into the Real-Time energy market based on a measure of magnitude and duration of under-generation.  The proposal, as amended at the TAC meeting, now includes a $750 per MWh offer price floor for ECRS capacity that is released to the Real-Time market dispatch model (Security-Constrained Economic Dispatch (SCED)) and ECRS capacity will not be released until a higher threshold for under-generation is achieved, 40 MW for ten minutes.  These parameters do not adequately mitigate the artificial price increase that resulted from ECRS administration in 2023 and is at the heart of this proposed change.

**⇒** Our proposed change is

* ECRS will be released when under-generation is 5 MW or greater for ten consecutive minutes (replacing 40 MW for ten minutes), and
* Released ECRS capacity will have an offer price floor of $100 per MWh imposed (replacing $750 per MWh).

We estimate the version approved at the TAC results in roughly $4 billion of excess cost (using 2023 figures) that is eliminated when artificial shortage is further averted using a lower under-generation threshold and artificially high prices are not protected with a high offer price cap for deployed capacity.

We also request that if the alternate parameters in this protest are not adopted, the Board of Directors reject the original proposal outright. Allowing ERCOT to deploy ECRS as needed to avert shortage conditions appears to be permitted under current practices and is a more sensible alternative than being forced to delay deployment until artificial shortage conditions have resulted in $1,000 prices (per the 40 MW under-generation trigger) and then protect those artificially high prices with a $750 per MWh offer price floor for the capacity that was deployed to relieve the scarcity condition.

We provide comments on the deployment trigger offer price floor aspects of the proposed design below, however those comments require discussion of the appropriate price baseline.

**Artificial Shortage Pricing Caused by ECRS**

The IMM provided analysis, most recently in December 2023, demonstrating that the existing practice of holding large quantities of ECRS out of SCED caused SCED to perceive shortages that were not real and set energy prices that were much higher than the true marginal reliability value of energy.1  This violates the most fundamental economic market design principle for wholesale electricity markets.

The reason sequestering the ECRS (and Responsive Reserve (RRS)) Resources from SCED resulted in artificial spikes in energy prices is that SCED will more quickly move up the supply curve and clear very high-priced generation resources and include an administrative shortage price via the power balance constraint penalty when available supply in SCED is insufficient.  The analysis also demonstrated that releasing even a portion of the sequestered ECRS into the Real-Time SCED generally relieved the artificial shortage and resulted in energy prices that did not reflect the artificial shortage.

Importantly, ERCOT has a robust framework to price shortages when they actually occur under the Operating Reserve Demand Curve (ORDC).  Hence, releasing ECRS and avoiding artificial shortage pricing does nothing to either increase overall reserve levels or prevent legitimate shortage pricing under the ORDC.

To mitigate the substantial costs of pricing shortages that are not real, we recommend the following: a re-evaluation of the ECRS procurement quantities, establishing a deployment trigger that eliminates SCED shortages that are not real shortages, and *not* applying an offer floor to the deployed Resources.  The first recommendation will hopefully be addressed through the Ancillary Service Study we are cooperatively developing with ERCOT and the PUCT.  The remaining two items are the subject of these comments and discussed below.

**ECRS Deployment Trigger**

The current proposal contains a trigger for the release of ECRS capacity to the Real-Time energy market based on measured under-generation.  Specifically, it would deploy ECRS when under-generation of at least 40 MW persists for ten minutes.

The underlying premise is that such conditions indicate an energy market need for the capacity that is sequestered. This deployment trigger is a considerable improvement over the practice in 2023 where there was no deployment. We believe that this trigger will likely avert the extreme price scenarios that were observed in 2023 that were the result of artificial shortage.

While releasing ECRS to the real-time energy market based on this trigger will avert more extreme artificial shortage conditions and resulting extreme high prices, we note that the trigger requires under-generation which will necessarily increase price. In under-generation conditions, the power balance constraint is violated, setting an administrative penalty price in the real-time market. Thus, we suggest the following:

* The under-generation value in the deployment trigger headroom (e.g., HDL minus GTBD) in SCED so ECRS is deployed *before* artificial shortages occur.  For example, a 200 MW headroom criteria is set at a very low value to minimize the impact of artificial shortage on price prior to deployment. We suggest a value of 5 MW of under-generation for two consecutive 5-minute intervals.
* Alternatively, ERCOT could establish a price-based trigger that would signal the need for the ECRS resources before artificial shortage conditions affected price.
* Such alternatives would eliminate most of the artificial shortage pricing caused by ECRS.  Some may still remain as rising demands could cause SCED to move from having headroom > 200 MW to under-generation in one interval.  Nonetheless, this would generally address the pricing concerns raised the ECRS implementation.

**Offer Price Floor**

The ERCOT proposal did not include an offer price floor for ECRS capacity that is released into the real-time energy market. The proposal was modified at the TAC to include a $750 per MWh price floor for offers from ECRS capacity that is released into the real-time energy market. The ostensible justification for this offer price floor is to avoid price suppression that can result from the injection of capacity with lower priced offers into the market, especially if the market price is higher reflecting administrative pricing.  Concerns about price suppression arise from two possible misconceptions about the deployment of ECRS.

*ECRS deployment is an out-of-market action / deployed ECRS is out-of-market (OOM) supply*.  It is easy to equate ECRS deployment with other truly OOM actions, such as reliability unit commitments, but this is a misconception.  It is only ERCOT’s market and software limitations that prevent ERCS capacity from being “in-market” and visible to SCED.  In reality, these resources have historically been in-market and they will be in-market in the future:

* Historically, the peaking resources that are not running but available to start quickly would be self-committed by their owners when conditions begin to tighten and prices start rising.  Importantly, such resources were free to be offered competitively and there was no price suppression concerns with such commitments.  The implementation of ECRS interferes with this competitive and efficient response to tightening conditions.
* In the future, when ERCOT implements real-time co-optimization (RTC) of reserves and energy, the ECRS capacity will be visible to the real-time market and optimally utilized.

*Deploying ECRS will deplete reserves and the effects of this depletion must be priced*.

This is also a misconception for two reasons:

* First, starting a peaking resource doesn’t generally deplete the reserves available to the system, it simply shifts the reserves from Off-Line to On-Line Resources.
* For example, when a peaking unit providing 50 MW of ECRS is deployed, it will start and be dispatched economically based on its offer curve.  If we assume it produces 40 MW of energy, the system will dispatch another unit down by 40 MW (effectively shifting online reserves to that unit) and the system will retain 10 MW of reserves on the unit that was deployed.
* Hence, the 50 MW still exist, they are now simply visible and optimized by SCED.
* Second, even if reserves levels do fall because SCED does not have sufficient supply to hold the same level of reserves online, the ORDC framework will capture this reserve reduction and price it.  No offer price floor is necessary.

If one sets aside these two misconceptions and views ECRS deployments accurately, it leads to a few clear conclusions:

* The Real-Time prices post-deployment are not artificially suppressed, instead it is the pre-deployment price that reflects the sequestering of the ECRS Resources that is artificially inflated.
* There is no basis for imposing and offer price floor on deployed ECRS.

Therefore, we strongly recommend that the proposed $750 per MWh offer price floor is reduced to $100 per MWh, which will preserve the quality ranking between ECRS and Non-Spinning Reserve (Non-Spin) in the Real-Time dispatch.  Keeping the proposed $750 per MWh floor would retain a significant portion of the artificial shortage pricing that we documented in 2023.  While this may be in the economic interest of suppliers in the short term, setting prices that are not based on market fundamentals (i.e., the marginal reliability value of supply) will undermine the credibility of the ERCOT markets over the longer term.  All participants have a stake the long-term credibility and competitiveness of the ERCOT markets.

As we have documented in past reports, the adjustments to the ORDC that have been implemented over the past few years have substantially increased shortage revenues, particularly for dispatchable Resources.  There is no need or basis to supplement such revenues with artificial shortage revenues generated by sequestering the ECRS Resources from SCED.

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| Revised Cover Page Language |

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| Revision Description | This Nodal Protocol Revision Request (NPRR) introduces a trigger that ERCOT may use to manually release ERCOT Contingency Reserve Service (ECRS) from Security-Constrained Economic Dispatch (SCED)-dispatchable Resources when the system power balance constraint is consistently violated and the MW amount of the power balance violation is at least 5 MW for ten consecutive minutes. This NPRR also requires that the Energy Offer Curves for the capacity assigned to ECRS be offered at no less than $100 per MWh. |
| Justification of Reason for Revision and Market Impacts | During the 2024 Ancillary Service methodology discussion at meetings of the Technical Advisory Committee (TAC) and the ERCOT Board of Directors (ERCOT Board), ERCOT was asked to review the methodology used to compute the minimum quantities of ECRS and identify potential alternatives by April 30, 2024, taking into account the analysis that the Independent Market Monitor (IMM) has conducted on the impact of ECRS. This timeline was selected so that proposed changes (if necessary) could be in place by summer 2024.  ERCOT and the IMM have been working on this issue. The IMM recommended a few changes to alleviate its concerns. ERCOT has closely reviewed these recommendations. One proposal was to require ERCOT to release some portion of ECRS in every hour at an energy offer floor via a standing deployment. ERCOT is agreeable to this proposal but notes that this concept may need some system changes (potentially both for systems at ERCOT and on the Market Participant end) and may not be feasible to implement by summer 2024.  Another IMM proposal was to allow ERCOT to manually release ECRS capacity from SCED-dispatchable Resources when the power balance constraint is violated. ERCOT has worked with the IMM to develop this concept further in a manner that would allow it to be implemented by summer 2024. Based on that work, this NPRR proposes to include a trigger that will allow manually releasing ECRS capacity on SCED-dispatchable Resources when the power balance constraint is consistently violated and the MW amount of the power balance violation is at least 5 MW for ten consecutive minutes. ERCOT is open to stakeholder comments regarding alternative values of power balance violation and duration.  When manually releasing SCED-dispatchable ECRS, ERCOT plans to preserve some SCED-dispatchable ECRS to ensure that ERCOT has sufficient capacity that can respond and help recover frequency within the parameters required by North American Electric Reliability Corporation (NERC) Reliability Standards. However, if the power balance constraint violation remains at or above 5 MW, ERCOT will continue to release ECRS in small blocks.  Further, when ECRS capacity from SCED-dispatchable Resources is manually released, ERCOT will recall the manually released ECRS when the triggering condition has ended and the ERCOT System is operating with a steady-state frequency above 59.97 Hz. |

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| Revised Proposed Protocol Language |

**6.4.4.3 Energy Offer Curve for On-Line ERCOT Contingency Reserve Capacity**

(1) The following applies to Generation Resources that a QSE assigns ERCOT Contingency Reserve Service (ECRS) Ancillary Service Resource Responsibility in its COP to meet the QSE’s Ancillary Service Supply Responsibility for ECRS and applies to On-Line ECRS assignments arising as the result of Day-Ahead Market (DAM) or Supplemental Ancillary Services Market (SASM) Ancillary Service awards, or Self-Arranged Ancillary Service Quantity.

(a) Prior to the end of the Adjustment Period for an Operating Hour during which a Generation Resource is assigned On-Line ECRS Ancillary Service Resource Responsibility, the QSE shall ensure that a valid Output Schedule or Energy Offer Curve for the Operating Hour has been submitted and accepted by ERCOT. The Energy Offer Curves submitted by the QSE for the capacity assigned to ECRS may not be offered at less than $100 per MWh.

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| ***[NPRR1058: Replace paragraph (a) above with the following upon system implementation:]***  (a) For an Operating Hour during which a Generation Resource is assigned On-Line ECRS Ancillary Service Resource Responsibility, the QSE shall ensure that a valid Output Schedule or Energy Offer Curve for the Operating Hour has been submitted and accepted by ERCOT. The Energy Offer Curves submitted by the QSE for the capacity assigned to ECRS may not be offered at less than $100 per MWh. |

(b) Prior to the end of the Adjustment Period for an Operating Hour during which a Controllable Load Resource is assigned ECRS Ancillary Service Resource Responsibility, the QSE shall ensure that an Energy Bid Curve for the Operating Hour has been submitted and accepted by ERCOT. The Energy Bid Curve submitted by the QSE for the capacity assigned to ECRS may not be less than $100 per MWh.

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| ***[NPRR1058: Replace paragraph (b) above with the following upon system implementation:]***  (b) For an Operating Hour during which a Controllable Load Resource is assigned ECRS Ancillary Service Resource Responsibility, the QSE shall ensure that an Energy Bid Curve for the Operating Hour has been submitted and accepted by ERCOT. The Energy Bid Curve submitted by the QSE for the capacity assigned to ECRS may not be less than $100 per MWh. |

(c) If the QSE also assigns Responsive Reserve (RRS) and/or Regulation Up Service (Reg-Up) to a Generation Resource that has been assigned ECRS, the QSE shall ensure that a valid Output Schedule or Energy Offer Curve for the Operating Hour has been submitted and accepted by ERCOT. The Energy Offer Curves submitted by the QSE for the capacity assigned to the sum of the RRS, ECRS, and Reg-Up, as well as any Non-Frequency Responsive Capacity (NFRC) that is above the Resource’s High Ancillary Service Limit (HASL) and will not be utilized prior to deployment of a Resource’s ECRS, may not be offered at less than $100 per MWh.

(d) If the QSE also assigns RRS, and/or Reg-Up to a Controllable Load Resource that has been assigned ECRS, the QSE shall ensure that a valid Energy Bid Curve for the Operating Hour has been submitted and accepted by ERCOT. The Energy Bid Curves submitted by the QSE for the capacity assigned to the sum of the RRS, ECRS and Reg-Up Ancillary Service Resource Responsibilities may not be less than $100 per MWh.

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| ***[NPRR1010: Delete Section 6.4.4.3 above upon system implementation of the Real-Time Co-Optimization (RTC) project.]*** |

**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 Controllable Load Resources 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.

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| **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:

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| **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 Controllable Load Resource 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 Controllable Load Resource’s telemetered quantities, ERCOT shall create a proxy energy bid as described below:

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| **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 Controllable Load Resource shall be responsible for all RTM Energy Bids, including bids updated by ERCOT as described above.

(8) If a Controllable Load Resource 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 Controllable Load Resource 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 Controllable Load Resource that can be verified by ERCOT. A QSE representing a Controllable Load Resource with a telemetered status of OUTL is still obligated to provide any applicable Ancillary Service Resource Responsibilities previously awarded to that Controllable Load Resource. 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 Controllable Load Resources, 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 Controllable Load Resources, whether submitted by QSEs or created by ERCOT. There is no mitigation of RTM Energy Bids. An RTM Energy Bid from a Controllable Load Resource represents the bid for energy distributed across all nodes in the Load Zone in which the Controllable Load Resource 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 Controllable Load Resource’s parameters in SCED if ERCOT determines that the Controllable Load Resource’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.

**6.5.7.6.2.4 Deployment and Recall of ERCOT Contingency Reserve Service**

(1) ECRS is intended to:

(a) Help restore the frequency to 60 Hz within ten minutes of a significant frequency deviation;

(b) Provide energy to avoid, or during the implementation of, an EEA;

(c) Provide backup to Reg-Up; and

(d) Provide energy upon detection of insufficient available capacity for net load ramps.

(2) ERCOT shall deploy ECRS to meet NERC Standards and other performance criteria as specified in these Protocols and the Operating Guides by taking one or more of the following actions:

(a) Automatic Dispatch Instruction signal to release ECRS capacity from Generation Resources and Controllable Load Resources to SCED; and/or

(b) Dispatch Instruction for deployment of energy from Load Resources via electronic Messaging System.

(3) ERCOT shall release ECRS from Generation Resources and Controllable Load Resources to SCED when frequency drops below 59.91 Hz and available Reg-Up is not sufficient to restore frequency. Upon deployment of Off-Line ECRS from a QSGR providing ECRS, the Resource’s Ancillary Service Schedule for ECRS must be adjusted for the ERCOT instructed ECRS deployment and the Resource’s status must be set to OFFQS to be available for dispatch by SCED. Once recalled QSGRs providing ECRS must follow the decommitment process outlined in Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process.

(4) Energy from Resources providing ECRS may also be manually deployed by ERCOT pursuant to Section 6.5.9, Emergency Operations.

(5) ERCOT may manually release up to 500 MW of ECRS capacity from SCED-dispatchable Resources when the power balance constraint is violated and the MW amount of power balance constraint violation is at or above 5 MW for at least ten consecutive minutes. Following such an ECRS release, if the power balance constraint violation remains at or above 5 MW, ERCOT may release additional MW of ECRS from SCED-dispatchable Resources. When manually releasing SCED-dispatchable ECRS, ERCOT may preserve some SCED-dispatchable ECRS to ensure that ERCOT has sufficient capacity that can respond and help recover frequency within the parameters required by NERC Reliability Standards. However, if the power balance constraint violation remains at or above 5 MW, ERCOT will continue to release ECRS in small blocks.

(6) ERCOT shall use SCED and Non-Spin as soon as practicable to recover ECRS reserves.

(7) Following an ECRS deployment to SCED-dispatchable Resources, the QSE’s obligation to deliver ECRS remains in effect until ERCOT issues a recall instruction or its ECRS obligation expires, whichever occurs first. Following an ECRS deployment to Load Resources, excluding Controllable Load Resources, or Resources operating in synchronous condenser fast-response mode, the QSE’s obligation to deliver ECRS remains in effect until ERCOT issues a recall instruction.

(8) Following a deployment or recall Dispatch Instruction of ECRS, a QSE shall adjust the telemetered ECRS Ancillary Service Schedule for the Resource providing the service and ERCOT shall adjust the HASL based on the QSE’s telemetered Ancillary Service Schedule for ECRS, as described in Section 6.5.7.2, Resource Limit Calculator, to account for such deployment.

(9) For Generation Resources and Controllable Load Resources providing ECRS, Base Points include ECRS energy as well as any other energy dispatched by SCED. A Resource must be able to be fully dispatched by SCED to its ECRS Ancillary Service Resource Responsibility within the ten-minute time frame according to its telemetered Emergency Ramp Rate.

(10) Each QSE providing ECRS shall meet the deployment performance requirements specified in Section 8.1.1.4.2, Responsive Reserve Energy Deployment Criteria.

(11) ERCOT shall issue instructions to release ECRS capacity provided from Generation Resources and Controllable Load Resources to SCED over ICCP and shall issue deployment instructions for Load Resources providing ECRS via XML. Such instructions shall contain the MW requested.

(12) To the extent that ERCOT deploys a Load Resource that is not a Controllable Load Resource and that has chosen a block deployment option, ERCOT shall either deploy the entire Ancillary Service Resource Responsibility or, if only partial deployment is possible, skip the Load Resource with the block deployment option and proceed to deploy the next available Resource.

(13) ERCOT shall recall automatically deployed ECRS capacity once system frequency recovers above 59.97 Hz.

(14) ERCOT shall recall ECRS deployment provided from a Load Resource that is not a Controllable Load Resource once PRC is above a pre-defined threshold, as described in the Operating Guides.

(15) ERCOT may recall manually released ECRS capacity from SCED-dispatchable Resources when the triggering condition in paragraph (5) has ended and the ERCOT System is operating with a steady-state frequency above 59.97 Hz.

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| ***[NPRR1010: Replace Section 6.5.7.6.2.4 above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project:]***  **6.5.7.6.2.4Deployment and Recall of ERCOT Contingency Reserve Service**  (1) ECRS is intended to:  (a) Help restore the frequency to 60 Hz within ten minutes of a significant frequency deviation;  (b) Provide energy to avoid, or during the implementation of, an EEA;  (c) Provide backup to Reg-Up; and  (d) Provide energy upon detection of insufficient available capacity for net load ramps.  (2) ERCOT shall deploy ECRS to meet NERC Standards and other performance criteria as specified in these Protocols and the Operating Guides by taking one or more of the following actions:  (a) ERCOT shall issue ECRS deployment Dispatch Instructions, specifying the required MW output, over ICCP for Resources awarded ECRS with a Resource Status of ONSC.  (b) Dispatch Instruction for deployment of energy from Load Resources via electronic Messaging System.  (3) Energy from Resources providing ECRS may also be manually deployed by ERCOT pursuant to Section 6.5.9, Emergency Operations.  (4) ERCOT shall use SCED and Non-Spin as soon as practicable to recover ECRS reserves.  (5) Following a manual ECRS deployment to Load Resources, excluding Controllable Load Resources, or Resources telemetering a Resource Status of ONSC, the QSE’s obligation to deliver ECRS remains in effect until ERCOT issues a recall instruction.  (6) For Generation Resources and Controllable Load Resources providing ECRS, Base Points include ECRS energy as well as any other energy dispatched by SCED. A Resource must be able to be fully dispatched by SCED to its ECRS Ancillary Service award within the ten-minute time frame according to its telemetered ramp rate that reflects the Resource’s capability of providing ECRS.  (7) Each Resource providing ECRS shall meet the deployment performance requirements specified in Section 8.1.1.4.2, Responsive Reserve Energy Deployment Criteria.  (8) ERCOT shall issue deployment instructions for Load Resources providing ECRS via XML. Such instructions shall contain the MW requested.  (9) To the extent that ERCOT deploys a Load Resource that is not a Controllable Load Resource and that has chosen a block deployment option, ERCOT shall either deploy the entire Ancillary Service award or, if only partial deployment is possible, skip the Load Resource with the block deployment option and proceed to deploy the next available Resource.  (10) ERCOT shall recall deployed ECRS capacity provided from Resource telemetering Resource Status of ONSC once system frequency recovers above 59.98 Hz.  (11) ERCOT shall recall ECRS deployment provided from a Load Resource that is not a Controllable Load Resource once PRC is above a pre-defined threshold, as described in the Operating Guides. |