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| NPRR Number | [1140](https://www.ercot.com/mktrules/issues/NPRR1140) | NPRR Title | Recovering Fuel Costs for Generation Above LSL During RUC-Committed Hours |
| Date of Decision | July 13, 2022 |
| Action | Tabled |
| Timeline  | Normal |
| Proposed Effective Date | To be determined |
| Priority and Rank Assigned | To be determined |
| Nodal Protocol Sections Requiring Revision  | 5.7.1.3, Revenue Less Cost Above LSL During RUC-Committed Hours9.14.7, Disputes for RUC Make-Whole Payment for Fuel Costs |
| Related Documents Requiring Revision/Related Revision Requests | None |
| Revision Description | This Nodal Protocol Revision Request (NPRR) permits Generation Resources to recover their fuel costs when instructed to start due to a Reliability Unit Commitment (RUC) and operate above the Generation Resource’s Low Sustained Limit (LSL). Specifically, this NPRR makes the following changes:* Remove the Max (0) function from the Revenue Less Cost Above LSL During RUC-Committed Hours (RUCEXRR) equation for Resources that have been granted a fuel dispute;
* Add a Reliability Unit Commitment Fuel Cost Adder (RUCFCA) to the Real-Time Energy Offer Curve Cost Cap (RTEOCOST) to represent the incremental cost of fuel for generation above LSL; and
* Provide clarification to Protocol Section 9.14.7 to allow for the recovery of such fuel costs via RUC Settlements.
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| Reason for Revision |  Addresses current operational issues. Meets Strategic goals (tied to the [ERCOT Strategic Plan](http://www.ercot.com/content/wcm/lists/144926/ERCOT_Strategic_Plan_2019-2023.pdf) or directed by the ERCOT Board). Market efficiencies or enhancements Administrative Regulatory requirements Other: (explain)*(please select all that apply)* |
| Business Case | Section 5.7.1.3 describes the equation to calculate the Revenue Less Cost Above LSL During RUC-Committed Hours by interval (RUCEXRR96). In this equation, the cost incurred by the Generation Resource is subtracted from its total revenues. The Real-Time Energy Offer Cost Cap (RTEOCOST), which represents the fuel cost for operations above LSL is based on the Fuel Index Price (FIP) or Fuel Oil Price (FOP) times a generic heat rate as defined in Protocol Section 4.4.9.3.3, Energy Offer Curve Cost Caps. If actual Resource fuel costs above LSL are greater than the RTEOCOST, the Resource is not able to recover its fuel costs since revenues above the RTEOCOST are subject to clawback. This NPRR adjusts the equation to ensure Generation Resources that receive a Reliability Unit Commitment can keep revenues or recover their fuel costs when these costs exceed what is calculated via the current RTEOCOST. Until system implementation of this NPRR, ERCOT will manually adjust the RUC Guarantee (RUCG) to include the additional fuel costs above LSL for which the QSE provides ERCOT with proof. To ensure Resources can recover their fuel costs above LSL, this NPRR creates a dispute driven mechanism that proposes removing the Max (0) function from RUCEXRR and adding a fuel cost adder to the RTEOCOST in the calculation of RUCEXRR96 for this situation. This adder represents the incremental cost of fuel and will be determined with an approved fuel dispute as described in Protocol Section 9.14.7, Disputes for RUC Make-Whole Payment for fuel Costs.ERCOT Staff requests that changes proposed for Section 9.14.7 be effective the day following Public Utility Commission of Texas (PUCT) approval of NPRR1140, with all other language effective upon system implementation of NPRR1140. |
| Credit Work Group Review | To be determined |
| PRS Decision | On 7/13/22, PRS voted unanimously to table NPRR1140 and refer the issue to WMS. All Market Segments participated in the vote. |
| Summary of PRS Discussion | On 7/13/22, participants reviewed the 6/30/22 Luminant and 7/7/22 TexGen Power comments, and requested that NPRR1140 be tabled and referred to WMS for further discussion of issues raised. |

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| Market Segment | Not Applicable |

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| **Comments Received** |
| **Comment Author** | **Comment Summary** |
| Luminant 063022 | Clarified language and supported ERCOT’s initial NPRR; proposed to utilize spot market fuel consistent with other Protocol Sections  |
| TexGen Power 070722 | Expressed concern that NPRR1140 was not a comprehensive solution to current market realities, and endorses an inefficient, dispute-driven process; opined that generator costs would flow through settlement processes, including the RUC Guarantee, mitigated offer curves, and the recovery of fuel costs above LSL during RUC-Committed hours if generators could reflect their verified actual costs in the gas adder |

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| **Market Rules Notes** |

None

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| Proposed Protocol Language Revision |

5.7.1.3 Revenue Less Cost Above LSL During RUC-Committed Hours

(1) The total revenue for a Resource operating above its LSL less the cost based on the Energy Offer Curve Cost Cap (as described in Section 4.4.9.3.3, Energy Offer Curve Cost Caps) during all RUC-Committed Hours of the Operating Day is Revenue Less Cost Above LSL During RUC-Committed Hours.

(2) The LSL used to calculate Revenue Less Cost Above LSL During RUC-Committed Hours for a Combined Cycle Train is the LSL that corresponds to the Combined Cycle Generation Resource, within the Combined Cycle Train, that is RUC-committed for the hour.

(3) For each RUC-committed Resource, Revenue Less Cost Above LSL During RUC-Committed Hours is calculated as follows:

If RUCFCA exists:

RUCEXRR *q, r, d* = [RUCEXRR96 *q, r, i*]

Otherwise:

RUCEXRR *q, r, d* = Max {0, [RUCEXRR96 *q, r, i*]}

Where,

RUCEXRR96 *q, r, i* = RTSPP *p, i* \* Max (0, RTMG *q, r, i* – (LSL *q, r, i* \* (¼)))

 + (-1) \* (VSSVARAMT *q, r, i* + VSSEAMT *q, r, i*)

 + (-1) \* EMREAMT *q, r, i*

 – (RTEOCOST *q, r, i* + RUCFCA *q, r, i*) \* Max (0, RTMG *q, r,i* – (LSL *q, r, i* \* (¼)))]}

Where,

RUCFCA *q, r, i* = Max(0, Weighted average actual fuel price \* Average heat rate - RTEOCOST *q, r, i*)

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| ***[NPRR1009 and NPRR1014: Replace applicable portions of the formula “RUCEXRR96******q, r, i” above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009; or upon system implementation for NPRR1014:]***RUCEXRR96 *q, r, i* = RTSPP *p, i* \* Max (0, RTMG *q, r, i* – (LSL *q, r, i* \* (¼))) + RTASREV *q, r, i* + (-1) \* (VSSVARAMT *q, r, i* + VSSEAMT *q, r, i*) + (-1) \* EMREAMT *q, r, i*  – (RTEOCOST *q, r, i* + RUCFCA *q, r, i*) \* Max (0, RTMG *q, r, i* – (LSL *q, r, i* \* (¼)))Where, RTASREV *q, r, i =* RTRUREV *q, r, i +* RTRDREV *q, r, i +* RTRRREV *q, r, i +* RTECRREV *q, r, i +* RTNSREV *q, r, i*And, RUCFCA *q, r, i* = Max(0, Weighted average actual fuel price \* Average heat rate - RTEOCOST *q, r, i*) |

The above variables are defined as follows:

| Variable | Unit | Definition |
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| RUCEXRR *q, r, d* | $ | *Revenue Less Cost Above LSL During RUC-Committed Hours*—The sum of the total revenue for Resource *r* represented by QSE *q* operating above its LSL less the cost during all RUC-Committed Hours, for the Operating Day *d*. When one or more Combined Cycle Generation Resources are committed by RUC, revenue less cost above LSL is calculated for the Combined Cycle Train for all RUC-committed Combined Cycle Generation Resources. |
| RUCEXRR96 *q, r, i* | $ | *Revenue Less Cost Above LSL During RUC-Committed Hours by interval*—The total revenue for Resource *r* represented by QSE *q* operating above its LSL less the cost during all RUC-Committed hours, for the Settlement Interval *i*. When one or more Combined Cycle Generation Resources are committed by RUC, revenue less cost above LSL is calculated for the Combined Cycle Train for all RUC-committed Combined Cycle Generation Resources. |
| RTSPP *p, i* | $/MWh | *Real-Time Settlement Point Price*—The Real-Time Settlement Point Price at the Resource’s Resource Node Settlement Point *p* for the Settlement Interval *i*. |
| RTEOCOST *q, r, i* | $/MWh | *Real-Time Energy Offer Curve Cost Cap*⎯The Energy Offer Curve Cost Cap for Resource *r* represented by QSE *q*, for the Resource’s generation above the LSL for the Settlement Interval *i.*  SeeSection 4.4.9.3.3. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RTMG *q, r, i* | MWh | *Real-Time Metered Generation*—The metered generation of Resource *r* represented by QSE *q* for the Settlement Interval *i*. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RUCFCA *q, r, i* | $/MWh | Reliability Unit Commitment Fuel Cost Adder — For a QSE that has been granted a fuel dispute, the fuel cost adder is calculated as the weighted average actual fuel price times the output-level average heat rate for Resource *r* represented by QSE *q*, for the Resource’s generation above LSL, for the Settlement Interval i, minus the Energy Offer Curve Cost Cap (RTEOCOST).When one or more Combined Cycle Generation Resources are committed by RUC, RUCFCA is calculated for the Combined Cycle Train for all RUC-Committed Combined Cycle Generation Resources. The average heat rate for the Resource shall represent the curve approved with verifiable costs, if available, otherwise the heat rate value defined in Protocols Section 4.4.9.3.3, Energy Offer Curve Cost Caps, for the applicable Resource type. The weighted average actual fuel price must be proven by the QSE by submitting a dispute per Protocol Section 9.14.7, Disputes for RUC Make-Whole Payment for Fuel Costs.  |
| LSL *q, r, i* | MW | *Low Sustained Limit*—The LSL of Generation Resource *r* represented by QSE *q* for the hour that includes the Settlement Interval *i*, as submitted in the COP. Where for a Combined Cycle Train, the Resource *r* is a Combined Cycle Generation Resource within the Combined Cycle Train.  |
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| ***[NPRR1009 and NPRR1014: Insert applicable variables below upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009; or upon system implementation for NPRR1014:]***

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| RTASREV *q, r, i* | $ | *Real-Time Ancillary Service Revenue* — The total Real-Time Ancillary Service revenue for QSE *q* calculated for Resource *r* for the 15-minute Settlement Interval *i*. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RTRUREV *q, r, i* | $ | *Real-Time Reg-Up Revenue* — The Real-Time Reg-Up revenue for QSE *q* calculated for Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RTRDREV *q, r, i* | $ | *Real-Time Reg-Down Revenue* — The Real-Time Reg-Down revenue for QSE *q* calculated for Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.7.5. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RTRRREV *q, r, i* | $ | *Real-Time Responsive Reserve Revenue* — The Real-Time RRS revenue for QSE *q* calculated for Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.7.5. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RTNSREV *q, r, i* | $ | *Real-Time Non-Spin Revenue* — The Real-Time Non-Spin revenue for QSE *q* calculated for Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.7.5. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |
| RTECRREV *q, r, i* | $ | *Real-Time ERCOT Contingency Reserve Service Revenue* — The Real-Time ECRS revenue for QSE *q* calculated for Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.7.5. Where for a Combined Cycle Train, the Resource *r* is the Combined Cycle Train. |

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| VSSVARAMT *q, r, i* | $ | *Voltage Support Service VAr Amount by interval*—The payment to the QSE *q* for the Voltage Support Service (VSS) provided by Generation Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.6.7.1, Voltage Support Service Payments. Payment for VSS is made to the Combined Cycle Train.

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| ***[NPRR1009 and NPRR1014: Replace applicable portions of the definition above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009; or upon system implementation for NPRR1014:]****Voltage Support Service VAr Amount*—The payment to the QSE *q* for the Voltage Support Service (VSS) provided by Generation Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.6.7.1, Voltage Support Service Payments. Payment for VSS is made to the Combined Cycle Train. |

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| VSSEAMT *q, r, i* | $ | *Voltage Support Service Energy Amount by interval*—The lost opportunity payment to the QSE *q* for ERCOT-directed VSS from the Generation Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.6.7.1. Payment for emergency energy is made to the Combined Cycle Train.

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| ***[NPRR1009 and NPRR1014: Replace applicable portions of the definition above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009; or upon system implementation for NPRR1014:]****Voltage Support Service Energy Amount*—The lost opportunity payment to the QSE *q* for ERCOT-directed VSS from the Generation Resource *r* for the 15-minute Settlement Interval *i*. See Section 6.6.7.1. Payment for emergency energy is made to the Combined Cycle Train. |

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| EMREAMT *q, r, i* | $ | *Emergency Energy Amount by interval*—The payment to the QSE *q* as additional compensation for the additional energy produced by the Generation Resource *r* in Real-Time during the Emergency Condition, for the 15-minute Settlement Interval *i*. See Section 6.6.9.1, Payment for Emergency Power Increase Directed by ERCOT. Payment for emergency energy is made to the Combined Cycle Train.

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| ***[NPRR1009 and NPRR1014: Replace applicable portions of the definition above with the following upon system implementation of the Real-Time Co-Optimization (RTC) project for NPRR1009; or upon system implementation for NPRR1014:]****Emergency Energy Amount*—The payment to the QSE *q* as additional compensation for the additional energy or Ancillary Services produced or consumed by the Resource *r* in Real-Time during the Emergency Condition, for the 15-minute Settlement Interval *i*. See Section 6.6.9.1, Payment for Emergency Operations Settlement. Payment for emergency energy is made to the Combined Cycle Train. |

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| *q* | none | A QSE. |
| *r* | none | A RUC-committed Generation Resource. |
| *d* | none | An Operating Day containing the RUC-commitment. |
| *p* | none | A Resource Node Settlement Point. |
| *i* | none | A 15-minute Settlement Interval within the hour that includes a RUC instruction. |

9.14.7 Disputes for RUC Make-Whole Payment for Fuel Costs

(1) If the actual price paid for delivered natural gas for a specific Resource during a Reliability Unit Commitment (RUC)-Committed Interval is greater than Fuel Index Price (FIP) adjusted by the proxy fuel adder, X, defined in the Verifiable Cost Manual (i.e., FIP \* (1+X)), then the QSE may file a Settlement dispute for that Resource’s RUC Make-Whole Payment. The maximum amount that may be recovered through this dispute process is the difference between the RUC Guarantee based on the actual price paid and the fuel price of FIP \* (1+X) . The QSE must provide documentation (invoices) that identifies intra-day or same-day costs of natural gas consumed during the RUC-Committed Interval. Such documentation is necessary to justify recovery of natural gas costs, which is limited to the actual fuel amount (MMBtus) consumed during RUC-Committed Intervals. All documentation submitted by the QSE for natural gas costs incurred intra-day or same-day must show a nexus from the seller or distributor of natural gas products to the QSE, Resource Entity or Generation Entity as the ultimate buyer. The QSE must demonstrate that the seller or distributor has procured natural gas fuel intra-day or same-day. A Power Purchase or Tolling Agreement (PPA) filed as documentation of proof of fuel costs will not be accepted unless the PPA was signed prior to July 16, 2008, and is not between Affiliates, subsidiaries, or partners.

 (2) If the actual price paid for the delivered fuel oil used to replace oil consumed during a RUC-Committed Interval is greater than Fuel Oil Price (FOP) adjusted by the proxy fuel adder, X, defined in the Verifiable Cost Manual (i.e., FOP \* (1+X)), then the QSE may file a Settlement dispute for the Resource’s RUC Make-Whole Payment. The maximum amount that may be recovered through this dispute process is the difference between the RUC Guarantee based on the actual price paid and the adjusted price, FOP \* (1+X).

(3) If the QSE representing the Generation Resource made a Three-Part Supply Offer into the DAM based on FIP and had to run on fuel oil in a RUC-Committed Hour with an active Three-Part Supply Offer based on the adjusted FIP, the QSE may file a Settlement dispute to recover the difference between the RUC Guarantee based actual price paid for delivered fuel oil and the fuel price of FIP \* (1+X).

(4) When filing a Settlement dispute under paragraph (2) or (3) above, the QSE must provide documentation (invoices) that identifies purchases of fuel oil by the QSE, Resource Entity, or Generation Entity to replace oil consumed for a RUC-Committed Interval. In addition, the QSE must provide proof that the Resource actually consumed fuel oil during the RUC-Committed Interval. Proof of actual consumption may be based on the Resource’s technical specifications or flow meters as appropriate. Documentation of fuel oil purchases must show that these were made no later than seven Business Days after the end of the last consecutive RUC-Committed Interval. Replacement fuel oil costs are limited to the actual gallons/barrels of fuel oil consumed during RUC-Committed Intervals.

(5) ERCOT may, in its sole discretion, consider documentation types other than those specifically listed in paragraphs (1) and (4) above when offered by a QSE in support of its recovery of fuel costs for RUC deployments. For example, ERCOT may require the Resource Input-output equation or average heat rate curve that allows for verification of fuel consumption for operation at and above LSL.

(6) Notwithstanding the fuel cost recovery process described in paragraphs (1), (2), or (3) above, the QSE may also submit proof of the weighted average actual price paid for fuel consumed by the Resource during a Reliability Unit Commitment (RUC)-Committed Interval for generation above LSL. ERCOT will adjust the RUC Guarantee (RUCG) to include the additional fuel costs above LSL filed by the QSE.

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| ***[NPRR1140: Replace paragraph (6) above with the following upon system implementation:]***(6) Notwithstanding the fuel cost recovery process described in paragraphs (1), (2), or (3) above, the QSE may also submit proof of the weighted average actual price paid for fuel consumed by the Resource during a Reliability Unit Commitment (RUC)-Committed Interval for generation above LSL.  |