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| NOGRR Number | [262](https://www.ercot.com/mktrules/issues/NOGRR262) | NOGRR Title | Provisions for Operator-Controlled Manual Load Shed |

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| Date | April 17, 2024 |

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| Submitter’s Information |
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| Market Segment | Investor Owned Utility (IOU) |

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| Comments |

CenterPoint Energy Houston Electric (CEHE) provides these comments to Nodal Operating Guide Revision Request (NOGRR) 262. CEHE comments were developed in coordination with ERCOT Staff to ensure accuracy and proper intent.

CEHE provides the following revisions:

* Inserts reference to NOG Section 4.5.3.3, EEA Levels, in Section 2.6.1, Automatic Firm Load Shedding, specifying that 25% of ERCOT System Load shall be equipped with provisions for automatic UFLS unless provisions in Section 4.5.3.3 are required to meet ERCOT operating instructions for manual Load shed.
* Clarifies in paragraph (7)(b) of Section 4.5.3, Implementation, that Supervisory Control and Data Acquisition (SCADA)-controlled Load shed methods are preferred, and that not all Transmission Operators (TOs)/Transmission and/or Distributions Service Providers (TDSPs) possess non-SCADA-controlled Load shed methods. Non-SCADA-controlled methods are to be utilized by the TO/TDSP only if the functionality exists for the TO and/or TDSP.
* Clarifies in paragraph (7)(c) Section 4.5.3 that whenever possible, the TO/TDSP shall restore SCADA-controlled Load by replacing it with non-SCADA-controlled Load when appropriate, in an effort to make SCADA-controlled Load available for a potential next Load shed event or instruction from ERCOT.

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| Market Rules Notes |

Please note the following NOGRRs propose revisions to the following sections:

* NOGRR256, Related to NPRR1191, Registration, Interconnection, and Operation of Customers with Large Loads; Information Required of Customers with Loads 25 MW or Greater
	+ Section 4.5.3.4

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| Revised Cover Page Language |

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| Nodal Operating Guide Sections Requiring Revision  | 2.6.1, Automatic Firm Load Shedding4.5.3, Implementation4.5.3.4, Load Shed Obligation8L, Emergency Operations Plan |

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| Revised Proposed Guide Language |

2.6.1 Automatic Firm Load Shedding

(1) At least 25% of the ERCOT System Load shall be equipped at all times with provisions for automatic Under-Frequency Load Shedding (UFLS) as described in this paragraph, unless provisions specified in Section 4.5.3.3, EEA Levels, are required to meet ERCOT operating instructions for manual Load shed. In the event of an under-frequency event, each Transmission Operator (TO) shall provide Load relief by shedding the required percentage of its Distribution Service Provider (DSP)-connected Load and transmission-level Customer Load using automatic under-frequency relays, as specified in Table 1, Standard UFLS Stages, below. TOs may, but are not required to, provide supplemental anti-stall under-frequency Load relief in the amounts described in Table 2, Supplemental Anti-Stall UFLS Stages, below. If the TOs provide supplemental anti-stall under-frequency Load relief, the under-frequency relays shall be set to use the frequency thresholds and time delays described in Table 2. For the purposes of this paragraph, the TO Load will be the amount of Load being served by the DSPs that the TO represents, as well as the TO’s transmission-level Customer Load, when the ERCOT frequency drops to the 59.5 Hz threshold. As such, TO Load that has already been removed from the system without restoration prior to the 59.5 Hz frequency threshold will not apply to meeting TO Load relief percentage requirements as stated in Table 1 and Table 2 below.

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| ***[NOGRR226: Replace paragraph (1) above with the following upon system implementation but no earlier than October 1, 2026:]***(1) At least 25% of the ERCOT System Load shall be equipped at all times with provisions for automatic Under-Frequency Load Shedding (UFLS) as described in this paragraph, unless provisions specified in Section 4.5.3.3, EEA Levels, are required to meet ERCOT operating instructions for manual Load shed. In the event of an under-frequency event, each Transmission Operator (TO) shall provide Load relief by shedding the required percentage of its Distribution Service Provider (DSP)-connected Load and transmission-level Customer Load using automatic under-frequency relays, as specified in Table 1, Standard UFLS Stages, and Table 2, Supplemental/Anti-Stall UFLS Stages, below. For the purposes of this paragraph, the TO Load will be the amount of Load being served by the DSPs that the TO represents, as well as the TO’s transmission-level Customer Load, when the ERCOT frequency drops to the 59.5 Hz threshold. As such, TO Load that has already been removed from the system without restoration prior to the 59.5 Hz frequency threshold will not apply to meeting TO Load relief percentage requirements as stated in Table 1 and Table 2 below.  |

Table 1: Standard UFLS Stages

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| **Frequency Threshold** | **TO Load Relief** | **Delay to Trip** |
| 59.3 Hz | At least 5% of the TO Load | No more than 30 cycles |
| 59.1 Hz | A total of at least 5% of the TO Load | No more than 30 cycles |
| 58.9 Hz | A total of at least 15% of the TO Load | No more than 30 cycles |
| 58.7 Hz | A total of at least 15% of the TO Load | No more than 30 cycles |
| 58.5 Hz | A total of at least 25% of the TO Load | No more than 30 cycles |
| ***[NOGRR247: Replace Table 1 above with the following upon system implementation but no earlier than October 1, 2026:]***

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| **Frequency Threshold** | **TO Load Relief** | **Delay to Trip** |
| 59.3 Hz | At least 5% of the TO Load | At least six cycles but no more than 30 cycles |
| 59.1 Hz | A total of at least 10% of the TO Load | At least six cycles but no more than 30 cycles |
| 58.9 Hz | A total of at least 15% of the TO Load | At least six cycles but no more than 30 cycles |
| 58.7 Hz | A total of at least 20% of the TO Load | At least six cycles but no more than 30 cycles |
| 58.5 Hz | A total of at least 25% of the TO Load | At least six cycles but no more than 30 cycles |

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Table 2: Supplemental/Anti-Stall UFLS Stages

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| **Frequency Threshold** | **TO Load Relief** | **Delay to Trip** |
| 59.5 Hz | At least 1.5% of the TO Load | 90 seconds |
| 59.5 Hz | A total of at least 3.0% of the TO Load | 120 seconds |
| 59.5 Hz | A total of at least 4.5% of the TO Load | 150 seconds |

(2) ERCOT will, prior to the peak each year, survey each TO’s compliance with the automatic Load shedding requirements described in paragraph (1) above, and report its findings to the Technical Advisory Committee (TAC). For purposes of determining a TO’s compliance with this annual survey requirement, TO Load will be the total amount of Load being served by the DSPs that the TO represents, as well as the TO’s transmission-level Customer Load, at the specified time of the survey. The TO shall identify those circuits armed with under-frequency relays, the corresponding amount of Load, and identify the frequency threshold. A TO shall not equip the entirety of its Load shed obligation in any one tier, and should endeavor to shed in controlled amounts that equal the difference between the TO Load relief required for each tier. If ERCOT identifies potential reliability issues related to distribution of Load shed across the tiers, ERCOT may require the TO to redistribute Load relief closer to the minimum amount required after submitting ERCOT’s proposal to redistribute Load relief to the TO and considering any comments submitted by the TO regarding the proposal. Compliance with this annual survey does not excuse the TO from compliance with the requirements of paragraph (1) above in an actual frequency event. To assist TOs, ERCOT will provide the TO’s inventory, including substation and capacity amounts, of registered Load Resources in its area within ten Business Days of receiving a request in writing from a TO.

(3) A TO may meet the Load relief requirements of the Supplemental anti-stall UFLS stages by utilizing Load that would otherwise be utilized to meet the 59.1 Hz, 58.9 Hz, 58.7 Hz, and 58.5 Hz standard UFLS stages. In this circumstance, the TO’s Load relief responsibility at the 59.1 Hz, 58.9 Hz, 58.7 Hz, and 58.5 Hz standard UFLS stages is reduced by the amount of Load already shed in the supplemental anti-stall UFLS stages. A TO may not meet the Load relief requirements of the supplemental anti-stall UFLS stages by utilizing Load that the TO needs to meet the 59.3 Hz standard UFLS stages.

(4) Additional under-frequency relays may be installed on Transmission Facilities with the approval of ERCOT provided the relays are set at 58.0 Hz or below, are not directional, and have at least 2.0 seconds time delay. A DSP may by mutual agreement arrange to have all or part of its automatic Load shedding requirement performed by another entity. ERCOT will be notified and provided with the details of any such arrangement prior to implementation.

(5) DSPs shall ensure, to the extent possible, and under the direction of ERCOT, that Loads equipped with under-frequency relays are dispersed geographically throughout the ERCOT Region to minimize the impact of Load shedding within a given geographical area. Customers equipped with under-frequency relays shall be dispersed without regard to which Load Serving Entity (LSE) serves the customer. DSPs shall ensure that Distribution Generation Resources (DGRs) and Distribution Energy Storage Resources (DESRs) are connected to circuits that are not subject to disconnection during UFLS events, except as permitted by Protocol Section 3.8.6, Distribution Generation Resources (DGRs) and Distribution Energy Storage Resources (DESRs). DSPs shall ensure that the under-frequency relays connected to each Load will operate with a fixed time delay as specified in paragraph (1) above. Total time from the time when a sustained under-frequency condition first reaches one of the values specified above to the time Load is interrupted shall be no more than the maximum fixed time delay specified in paragraph (1) above plus 10 cycles, including all relay and breaker operating times, and no less than any applicable minimum fixed time delay specified in paragraph (1) above. If the frequency drops below 58.5 Hz, ERCOT shall determine additional steps to continue operation.

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| ***[NOGRR250: Replace paragraph (5) above with the following upon system implementation of NPRR1171:]***(5) DSPs shall ensure, to the extent possible, and under the direction of ERCOT, that Loads equipped with under-frequency relays are dispersed geographically throughout the ERCOT Region to minimize the impact of Load shedding within a given geographical area. Customers equipped with under-frequency relays shall be dispersed without regard to which Load Serving Entity (LSE) serves the customer. DSPs shall ensure that the under-frequency relays connected to each Load will operate with a fixed time delay as specified in paragraph (1) above. Total time from the time when a sustained under-frequency condition first reaches one of the values specified above to the time Load is interrupted shall be no more than the maximum fixed time delay specified in paragraph (1) above plus 10 cycles, including all relay and breaker operating times, and no less than any applicable minimum fixed time delay specified in paragraph (1) above. If the frequency drops below 58.5 Hz, ERCOT shall determine additional steps to continue operation. |

(6) If a loss of Load occurs due to the operation of under-frequency relays, a DSP or its designee may rotate the physical Load interrupted to minimize the duration of interruption experienced by individual Customers or to restore the availability of under-frequency Load-shedding capability. In no event shall the initial total amount of Load without service be decreased without the approval of ERCOT. TOs, in coordination with DSPs, shall make every reasonable attempt to restore Load, either by automatic or manual means, to preserve system integrity. Restoration of any Load shed by UFLS systems, including supplemental anti-stall UFLS Load, shall be coordinated with ERCOT by the TO. In the event frequency drops below any of the frequency thresholds specified in the tables in paragraph (1) above, and a TO’s UFLS relays that previously activated as a result of reaching that same frequency threshold have not been restored since the previous excursion, the Load on the feeders controlled by those relays shall be counted toward the TO’s satisfaction of the percentages in paragraph (1) above for that subsequent frequency excursion.

4.5.3 Implementation

(1) ERCOT shall be responsible for monitoring system conditions, initiating the EEA levels below, notifying all Qualified Scheduling Entities (QSEs) representing Resources and Transmission Operators (TOs), and coordinating the implementation of the EEA conditions while maintaining transmission security limits. QSEs and TOs will notify all the Market Participants they represent of each declared EEA level.

(2) During the EEA, ERCOT has the authority to obtain energy from non-ERCOT Control Areas using Direct Current Tie(s) (DC Tie(s)) or by using Block Load Transfers (BLTs) to move load to non-ERCOT Control Areas. ERCOT maintains the authority to curtail energy schedules flowing into or out of the ERCOT System across the DC Ties in accordance with North American Electric Reliability Corporation (NERC) scheduling guidelines.

(3) ERCOT, at management’s discretion, may at any time issue an ERCOT-wide appeal through the public news media for voluntary energy conservation.

(4) There may be insufficient time to implement all levels in sequence. ERCOT may immediately implement EEA Level 2 when clock-minute average system frequency falls below 59.91 Hz for 15 consecutive minutes. ERCOT may immediately implement Level 3 of the EEA any time the clock-minute average system frequency falls below 59.91 Hz for 20 consecutive minutes or when steady-state frequency falls below 59.8 Hz for any duration of time. ERCOT shall immediately implement Level 3 any time the steady-state frequency is below 59.5 Hz for any duration.

(5) Percentages for Level 3 Load shed will be based on the previous year’s TSP peak Loads, as reported to ERCOT, and will be reviewed by ERCOT and modified annually.

(6) The ERCOT System Operator shall declare the EEA levels to be taken by QSEs and TSPs. QSEs and TSPs shall implement actions under that level (and all above if not previously accomplished) and if ordered by the ERCOT shift supervisor or his designate, shall report back to the ERCOT System Operator when the requested level has been completed.

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| ***[NOGRR177: Replace paragraph (6) above with the following upon system implementation of NPRR857:]***(6) The ERCOT System Operator shall declare the EEA levels to be taken by QSEs, TSPs, and DCTOs. QSEs, TSPs, and DCTOs shall implement actions under that level (and all above if not previously accomplished) and if ordered by the ERCOT shift supervisor or his designate, shall report back to the ERCOT System Operator when the requested level has been completed.  |

(7) During EEA Level 3, ERCOT must be capable of manually shedding sufficient firm Load to arrest frequency decay and to prevent generator tripping. The amount of manual firm Load to be shed may vary depending on ERCOT Transmission Grid conditions during the event. Each TSP will be capable of manually shedding its allocation of firm Load, without delay, avoiding whenever possible the use of Load designated as critical or for Under-Frequency Load Shed (UFLS)/ Under-Voltage Load Shed (UVLS). The maximum time for the TSP to interrupt firm Load will depend on how much Load is to be shed and whether the Load is to be interrupted by Supervisory Control and Data Acquisition (SCADA) or other, non-SCADA-controlled methods. Since the need for firm Load shed is immediate, interruption by SCADA is preferred. Each TO, TSP, and TDSP and their designated agents will comply with the following requirements when implementing an ERCOT instruction to shed firm Load:

(a) Load interrupted manually by SCADA will be shed without delay upon receipt of a Load shed instruction and in a time period not to exceed 30 minutes after receipt of the Load shed instruction for each Entity’s portion of every Load shed instruction. SCADA-controlled Load shed should be utilized before non-SCADA controlled Load shed when executing a Load shed instruction;

(b) If sufficient amounts of SCADA-controlled Load are not available to fully execute a manual Load shed instruction, the TO and/or TDSP(s) shall complete, if possible, the remaining manual Load shed through non-SCADA-controlled Load shed methods without delay upon receipt of a Load shed instruction and in a time period not to exceed one hour after receipt of the Load shed instruction; and

(c) Whenever possible, the TO and/or TDSP(s) shall restore SCADA-controlled Load by using non-SCADA-controlled Load not shed in paragraph (b) above, when appropriate, in an effort to make SCADA-controlled Load available for a potential next event.

(8) Each TSP, or its designated agent, will provide ERCOT a status report of Load shed progress within 30 minutes of the time of ERCOT’s instruction or upon ERCOT’s request.

(9) During EEA Level 2 or 3, for those constraints that meet the criteria identified in paragraph (3)(a) of Section 4.5.3.1, General Procedures Prior to EEA Operations, ERCOT may control the post-contingency flow to within the 15-Minute Rating in Security-Constrained Economic Dispatch (SCED). After Physical Responsive Capability (PRC) is restored to at least 3,000 MW or the Emergency Condition has ended, whichever is later, and ERCOT has determined that system conditions have improved such that the chance of re-entering into an EEA Level 2 or 3 is low, ERCOT shall restore control to the post-contingency flow to within the Emergency Rating for these constraints that utilized the 15-Minute Rating in SCED.

(10) During EEA Level 2 or 3, for those constraints that meet the criteria identified in paragraph (3)(b) of Section 4.5.3.1, ERCOT shall continue to enforce constraints associated with double-circuit contingencies throughout an EEA if the double-circuit failures are determined to be at high risk of occurring, due to system conditions. For all other double-circuit contingencies identified in paragraph (3)(b) of Section 4.5.3.1, ERCOT will enforce only the associated single-circuit contingencies during EEA Level 2 or 3. ERCOT shall resume enforcing such constraints as a double-circuit contingency after PRC is restored to at least 3,000 MW or the Emergency Condition has ended, whichever is later, and ERCOT has determined that system conditions have improved such that the chance of re-entering into an EEA Level 2 or 3 is low. For constraints related to stability limits that are not IROLs, ERCOT may elect not to enforce double-circuit contingencies during EEA Level 3 only.

4.5.3.4 Load Shed Obligation

(1) Each TO shall take and direct actions to ensure that ERCOT Load shed instructions are effectuated. Each DSP shall comply with any reasonable instruction given by its TO to effectuate Load shed obligations.

(2) Load shed obligation percentages for ERCOT EEA Level 3 Load shed will be determined by calculating each TO’s Load as a percentage of the ERCOT System summer and winter peak 15 minute Demand interval. For the purposes of this paragraph, TO Load will be the amount of Load being served by all of the TDSPs that the TO represents. The calculations for summer and winter Load shed obligation percentage are as follows:

(a) The calculated Load shed obligation percentage for the summer Season will be based on the single highest coincident ERCOT System peak 15 minute Demand interval for the summer months of June through September as reflected in the 4-Coincident Peak (4-CP) data submitted by ERCOT to the Public Utility Commission of Texas (PUCT) for that year. Anticipated revisions to the summer Load shed table shall be posted as described in paragraph (4) below no later than March 31st of each year based on data from the previous calendar year.

(b) The calculated Load shed obligation percentage for the winter Season will be based on the single highest coincident ERCOT System peak 15 minute Demand interval for the winter months of December through February as reflected at the time that ERCOT extracts the Load data for the winter Season from its settlement system. Anticipated revisions to the winter Load shed table shall be posted as described in paragraph (4) below no later than August 31st of each year based on data from December of the previous calendar year and January through February of the current year.

(3) The summer Load shed table will be used during a hot weather Load shed event and the winter Load shed table will be used during a cold weather Load shed event. ERCOT will determine, in its sole discretion, whether an EEA event will be treated as a hot weather or cold weather Load shed event based on the weather conditions. The summer and winter Load shed time periods will be published annually with the updated obligation tables in paragraph (2) above. In addition, if ERCOT issues an Operating Condition Notice (OCN), it will notify Market Participants which Load shed table would apply to the potential Load shed event. When ERCOT directs TOs to shed Load, it will specify which Load shed table applies for the Load shed event. ERCOT shall use the same Load shed table for the duration of a Load shed event.

(4) ERCOT shall maintain the Seasonal Load shed tables reflecting each TO’s total Load shed obligation on the ERCOT website. The Load shed obligation percentages will be reviewed by ERCOT and revised as described above, or as otherwise deemed appropriate by ERCOT, to reflect any new or changed TO designation by a DSP. Adjustments to the Load shed obligations due to changes in TO designations will be performed using the same Load data upon which the table was based. Following ERCOT’s Seasonal peak Load reviews or ERCOT’s receipt of any new or changed TO designation, ERCOT shall post any anticipated revisions to the Load shed tables on the ERCOT website. ERCOT shall issue a Market Notice announcing the posting of the revisions at least ten days prior to the effective date of the revisions or as soon as practicable if ERCOT determines there is a need to correct the Market Notice less than ten days before the effective date.

(5) Each TO shall coordinate with each TDSP it represents to:

(a) Minimize overlap of circuits that are designated for manual firm Load shed with circuits that serve designated critical Loads; and

(b) Minimize overlap of circuits that are designated for manual firm Load shed with circuits that are utilized for UFLS and UVLS.

**ERCOT Nodal Operating Guides**

**Section 8**

**Attachment L**

**Emergency Operations Plan**

**TBD**

This attachment provides a template to be used by each Transmission Operator (TO) for the development of its emergency operations plan to mitigate operating emergencies, as required by the applicable North American Electric Reliability Corporation (NERC) Reliability Standard. The emergency operations plan can be made up of multiple parts and does not need to be a single document. When multiple parts are used, the TO shall include documentation describing the location of each element required by the applicable NERC Reliability Standard. Each plan should include each of the elements listed below:

I. PURPOSE – The purpose statement will address the TO’s operations plan to mitigate operating emergencies.

II. SCOPE – The scope statement shall provide, in a brief summary, the boundaries of the emergency operations plan and to whom the emergency operations plan applies.

III. DEFINITIONS – Definitions of terms that are used in the TO emergency operations plan that are not common to the ERCOT Region. Define what is considered an operating emergency.

IV. KEY PERSONNEL ROLES AND RESPONSIBILITIES – Identify roles and responsibilities of key personnel that are responsible for activating the plan.

V. PROCESSES TO PREPARE FOR AND MITIGATE EMERGENCIES – Include the following:

A. Notification to ERCOT to include current and known projected Real-Time conditions, when experiencing an operating emergency;

B. Cancellation of Transmission Facility Outages;

C. Transmission system reconfiguration;

D. Operator-controlled manual Load shed during an Emergency Condition that accounts for each of the following:

1. Provisions for manual Load shed capable of being implemented in a timeframe adequate for mitigating the emergency;

2. Provisions to minimize the overlap of circuits that are designated for manual Load shed and circuits that serve designated critical loads;

3. Provisions to minimize the overlap of circuits that are designated for manual Load shed and circuits that are utilized for Under-Frequency Load Shed (UFLS) or Under-Voltage Load Shed (UVLS); and

4. Provisions to limit the utilization of UFLS or UVLS circuits for manual Load shed to situations where such use is consistent with the ERCOT Nodal Protocols and ERCOT Nodal Operating Guide and is warranted by system conditions.

E. Provisions to determine reliability impacts of:

1. cold weather conditions; and

2. extreme weather conditions.