

**ERCOT Contingency Reserve Service (ECRS)**

**Deployment and Recall Procedure**

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**Version 0.2**

**Document Revisions**

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**PROTOCOL DISCLAIMER**

This document describes ERCOT Systems and the response of these systems to Market Participant submissions incidental to the conduct of operations in the ERCOT Texas Nodal Market implementation and is not intended to be a substitute for the ERCOT Nodal Protocols (available at <http://www.ercot.com/mktrules/nprotocols/current>), as amended from time to time. If any conflict exists between this document and the ERCOT Nodal Protocols, the ERCOT Nodal Protocols shall control in all respects.

**Table of Contents**

[1. Introduction 4](#_Toc132280332)

[2. ECRS Deployment 5](#_Toc132280333)

[2.1 SCED dispatchable Resources (including Energy Storage Resources, Quick Start Generation Resources and Controllable Load Resources) 6](#_Toc132280334)

[2.2 Generation Resources Operating in Synchronous Condenser Mode Using Resource Status ONECRS 6](#_Toc132280335)

[2.3 Load Resource that is not a Controllable Load Resource with ECRS Ancillary Service Resource Responsibility 8](#_Toc132280336)

[3. Recall of ECRS Deployment 9](#_Toc132280337)

[4. ECRS Deployment and Recall Procedure Revision Process 10](#_Toc132280338)

## 1. Introduction

ERCOT Contingency Reserve Service (ECRS) is a service that is provided using capacity that can be sustained at a specified level for two consecutive hours. ECRS may be provided by unloaded, On-Line Generation Resource capacity; Quick Start Generation Resources (QSGRs); Load Resources that may or may not be controlled by high-set, underfrequency relays; Controllable Load Resources; and Generation Resources operating in synchronous condenser fast-response mode as defined in the Operating Guides. ECRS may be deployed to restore frequency within 10 minutes of a significant frequency deviation to recover deployed Regulation Service, to compensate for intra-hour net load forecast uncertainty and variability on days in which large amounts of online thermal ramping capability is not available, or when there is a limited amount of capacity available for Security-Constrained Economic Dispatch (SCED).

Per Paragraph (4) of Nodal Protocol Section 3.18, Resource Limits in Providing Ancillary Service,

1. The full amount of ECRS provided from an On-Line Generation Resource (and Controllable Load Resource) must be less than or equal to ten times the Emergency Ramp Rate;
2. The full amount of ECRS provided by a Quick Start Generation Resource (QSGR) must be less than or equal to its proven ten-minute capability as demonstrated pursuant to paragraph (16) of Section 8.1.1.2, General Capacity Testing Requirements;
3. Generation Resources operating in the synchronous condenser fast-response mode may provide ECRS up to the Generation Resource’s proven 20-second response capability (which may be 100% of the HSL). The initiation setting of the automatic under-frequency relay setting shall not be lower than 59.80 Hz; and
4. For any Load Resources controlled by under-frequency relay and providing ECRS, the initiation setting of the automatic under-frequency relay setting shall not be lower than 59.70 Hz. To provide ECRS, Load Resources are not required to be controlled by under-frequency relays.

The following are four situations that will cause the ERCOT Contingency Reserve Service (ECRS) to be deployed

* Disturbance conditions such as unit trip, sustained frequency decay or sustained low frequency operations;
* Detection of insufficient capacity for net load ramps during periodic checking of available capacity;
* SCED not having enough energy available to execute successfully; or
* When Resources providing ECRS are the only reasonable option(s) available to the operator for resolving local issues

In each of these cases, ECRS will be deployed and recalled pursuant to the Nodal Protocol Section 6.5.7.6.2.4, Deployment and Recall of ERCOT Contingency Reserve Service. ECRS from Security Constrained Economic Dispatch (SCED) dispatchable Resources will be automatically released when frequency declines below 59.91 Hz and available Reg-Up is not sufficient to restore frequency. The ERCOT operator will also be able to release ECRS manually depending on current and expected system conditions. In every case where an ECRS deployment trigger is met, the ERCOT operator will make the final decision and may initiate ECRS deployment. ERCOT shall deploy ECRS in amounts sufficient to respond to the operational circumstances. This means that ECRS may be deployed partially over time or may be deployed in its entirety. When deploying ECRS from the Load Resources that are not Controllable Load Resources, ERCOT shall either deploy the entire Ancillary Service Resource Responsibility or, if only partial deployment is possible, to the extent possible, bypass the Load Resources with block deployment option and proceed to deploy the next available Resource.

## 2. ECRS Deployment

ERCOT may deploy ECRS under the following conditions,

* Following large unit trips or other large frequency deviations, ECRS from SCED dispatchable resources (including Quick Start Generation Resources) will be automatically released when frequency drops below 59.91 Hz and power requirement to restore the frequency to normal exceeds remaining Regulation Up.
* To respond to the issues related to net load ramps, ERCOT may use the following two triggers to decide when manual release of ECRS from SCED Dispatchable Resources is needed.
  + (PRC – 3200 MW) – (projected 10min Net Load Ramp) + Remaining QSGR capacity < 300 MW
  + (10 min Ramp Capacity) – (Projected 10 min Net Load Ramp) < 0 MW
  + SCED under-generation is more than 40 MW for 10 consecutive minutes
* The Generation Resources operating in Synchronous Condenser fast response mode that are providing ECRS (using Resource Status of ONECRS) May Automatically deploy when frequency drops below 59.80 Hz. ERCOT operators may also manually deploy these ONECRS Resources (A) to meet the NERC standard defined in Nodal Protocol Section 6.5.7.6.2.4(2) (B) or during scarcity conditions following declaration of an EEA as described in Nodal Protocol Section 6.5.9.4.5(1).
* When Resources providing ECRS are the only reasonable option available to the operator for resolving congestion or other local issues.

Lastly, note that Load Resources that are not Controllable Load Resources providing ECRS will be separated into deployment groups as defined in Nodal Protocol Section 6.5.9.4.2 (2).

If a condition other than those listed above indicates that additional capacity may be needed to manage reliability, operators will evaluate the system condition and deploy ECRS as needed if no other better options are available to resolve the system condition. Under emergency, the emergency process will govern the deployment of ECRS.

Following an ECRS deployment, the following steps should be taken:

### 2.1 SCED dispatchable Resources (including Energy Storage Resources, Quick Start Generation Resources and Controllable Load Resources)

* The Qualified Scheduling Entity (QSE) will be sent an ECRS Deployment Instruction with requested MW’s via Inter-Control Center Communications Protocol (ICCP).
* Upon receiving an ECRS Deployment Instruction via ICCP, the QSE shall adjust the telemetered ECRS Ancillary Service Schedule within 1 minute for SCED dispatchable Resources that have a non-zero ECRS Ancillary Service Responsibility (as described in Paragraph (1)(a) of Nodal Protocol Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria).
* ERCOT will automatically calculate each Resource’s new HASL constraint for SCED using the Resource’s telemetered ECRS Ancillary Service Schedule.
* The QSE must, at a minimum, ensure that the Emergency Ramp Rate represented by the Resource’s ramp rate curve is sufficient to allow SCED to fully Dispatch the Resource’s ECRS Resource Responsibility within 10 minutes.
* The QSE can restore ECRS Ancillary Service Schedule once the ICCP Deployment Instruction reflects zero MW ECRS deployment.

### 2.2 Generation Resources Operating in Synchronous Condenser Mode Using Resource Status ONECRS

ERCOT will deploy and recall Generation Resources operating in synchronous condenser fast response mode carrying ECRS (using Resource Status = ONECRS) using ICCP Deployment Instruction that is separate from other ECRS Deployment Instruction for other SCED dispatchable Resources providing ECRS. ONECRS Resources may be deployed automatically when frequency falls below 59.80 Hz or manually, (A) to meet the NERC Standard defined in Nodal Protocol Section 6.5.7.6.2.4 (2), or (B) during scarcity conditions following declaration of an EEA Nodal Protocol Section 6.5.9.4.2(1).

* ***Automatic Deployment Expectations***
  + As noted in Paragraph (4)(c) of Nodal Protocol Section 3.18, the initiation setting of the automatic under-frequency relay for ONECRS Resources shall not be lower than 59.80 Hz. Upon getting triggered, full response must be provided in 20 seconds.
  + When frequency drops below 59.80 Hz, ERCOT will follow-up with a QSE level ICCP Deployment Instruction, that equals the total ECRS Ancillary Service Responsibility of Resources telemetering Resource Status of ONECRS in the QSE’s fleet.
  + Upon receiving an ECRS Deployment Instruction via ICCP, the QSE shall adjust the telemetered ECRS Ancillary Service Schedule on each ONECRS Resource within 1 minute (as described in Paragraph (1)(a) of Nodal Protocol Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria).
  + Following recovery from the event once operating under normal conditions with steady-state system frequency above 59.98 Hz, ERCOT will reset the ONECRS ICCP Deployment signal to reflect zero MW deployment. QSEs can restore ONECRS capability and stop generating MW from ONECRS Resources once the ICCP Deployment signal reflects zero MW ECRS deployment.
  + If there is an automatic deployment and the ONECRS Resource subsequently does not receive non-zero QSE level ECRS ICCP Deployment signal from ERCOT, the QSE will reach out to ERCOT operators to restore ONECRS capability.
* ***Manual Deployment under EEA Condition***

The Resources telemetering Resource Status of ONECRS may be manually deployed following declaration of EEA Level 1 but before ERCOT enters EEA Level 2. When ERCOT declares EEA Level 2 or EEA Level 3 without declaring EEA level 1, ERCOT may immediately deploy ONSC Resources.

* + The Qualified Scheduling Entity (QSE) will be sent a (manual) Deployment Instruction via ICCP to deploy all available ECRS MW capacity from Generation Resources that are telemetering Resource Status of ONECRS.
  + Upon receiving the ECRS Deployment Instruction via ICCP, the QSE shall ensure that the ECRS Ancillary Service Schedule telemetry for the ONECRS resources has been reduced to zero within a minute and deploy all available ECRS capacity within 10 minutes.
  + Following the recovery from the event, once operating under normal conditions with steady-state system frequency above 59.98 Hz (ex. with PRC above 3,000 MW and stable system frequency above 59.98 Hz), ERCOT will reset the ONECRS ICCP Deployment signal to reflect zero MW deployment. QSEs can restore ONECRS capability and stop generating MW from ONECRS Resources once the ICCP Deployment signal reflects zero MW ECRS deployment.
* ***Manual Deployment under Non-EEA Condition***
  + The Qualified Scheduling Entity (QSE) will be sent a (manual) Deployment Instruction via ICCP, to deploy all available ECRS MW capacity from Generation Resources that are telemetering Resource Status of ONECRS.
  + Upon receiving the ECRS Deployment Instruction via ICCP, the QSE shall ensure that the ECRS Ancillary Service Schedule telemetry for the ONECRS resources has been reduced to zero within a minute and deploy all available ECRS capacity within 10 minutes.
  + Following recovery from the event once operating under normal conditions with steady-state system frequency above 59.98 Hz, ERCOT will reset the ONECRS ICCP Deployment signal to reflect zero MW deployment. QSEs can restore ONECRS capability and stop generating MW from ONECRS Resources once the ICCP Deployment signal reflects zero MW ECRS deployment.

### 2.3 Load Resource that is not a Controllable Load Resource with ECRS Ancillary Service Resource Responsibility

For Load Resources that are not Controllable Load Resource, the Qualified Scheduling Entity (QSE) must use the telemetered Resource Status as ONECL to provide ECRS i.e., have a non-zero ECRS Ancillary Service Responsibility. Further note that in the ONECL Resource Status the Resource is able to provide RRS-UFR as well i.e., it can telemeter a non-zero RRS Ancillary Service Responsibility.

* Load Resources that are not Controllable Load Resources that are providing ECRS will be separated into deployment groups as defined in Nodal Protocol Section 6.5.9.4.2 EEA Levels paragraph (2).
* The QSE will be sent a Resource-specific XML Dispatch Instruction via ERCOT Ancillary Service Manager indicating a time and date stamp, QSE, Dispatch Asset Code, and Deployed MW. The Dispatch Instruction will also include the expected amount of capacity that will be expected to be deployed by the Load Resource within 10 minutes.
* Upon receiving the Deployment Instruction, the QSE shall ensure that the ECRS Ancillary Service Schedule telemetry for that Load Resource has been reduced to zero within one minute (as described in Paragraph (1)(a) of Nodal Protocol Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria).
* The Load Resource must operate at ERCOT instructed level and, at a minimum, be capable of remaining deployed until recalled.
* Following recovery from the event once operating under normal conditions with steady-state system frequency above 59.98 Hz, ERCOT will recall the ECRS deployment for Load Resources that are not Controllable Load Resource.

## 3. Recall of ECRS Deployment

The deployed ECRS may be recalled in manner that is expected to maintain sufficient 10-minute ramp capability with the system operating under normal conditions and at stable steady-state system frequency above 59.98 Hz. Following a deployment, a QSE can restore ECRS Ancillary Service Schedule on SCED dispatchable Resources (including Energy Storage Resources, Quick Start Generation Resources and Controllable Load Resources) when the ICCP Deployment Instruction reflects zero MW ECRS deployment. Similarly following a deployment, a QSE can restore ECRS Ancillary Service Schedule on Generation Resources operating in synchronous condenser fast response mode using Resource Status ONECRS when the ONECRS ICCP Deployment Instruction reflects zero MW ECRS deployment.

Following the recall of a ECRS deployment, the following steps should be taken:

* The QSE for SCED dispatchable Resources (including Energy Storage Resources, Quick Start Generation Resources) and Controllable Load Resources may set the value of the ECRS Ancillary Service Schedule equal to Resource’s ECRS Ancillary Service Responsibility.
* Online Quick Start Generation Resources may follow the process outlined in Nodal Protocol Section 3.8.3.1, Quick Start Generation Resource Decommitment Decision Process to take the Resource Off-Line.
* The QSE for Generation Resources Operating in Synchronous Condenser Mode Using Resource Status ONECRS can restore ONECRS capability and stop generating MW from ONECRS Resources once the ICCP Deployment signal reflects zero MW ECRS deployment.
* The QSE with a Load Resource that is not a Controllable Load Resource that has provided ECRS shall ensure that the Load energy and ECRS capability is restored withing three hours of ECRS recall instruction issued by ERCOT. If the QSE cannot restore the within three hours of ERCOT recall instruction, the ECRS obligation must be replaced by the QSE from other ECRS qualified Resources capable of providing ECRS.
* The QSE shall ensure that the ECRS Ancillary Service Schedule telemetry for the Load Resource that is not a Controllable Load Resource continuously and accurately represents the amount of Load Resource that has been restored following recall instruction and is available for subsequent deployment.

## 4. ECRS Deployment and Recall Procedure Revision Process

Revisions to the ECRS Deployment and Recall Procedure shall be made as necessary to meet relevant rules in the ERCOT Nodal Protocols and Operating Guides.