

**Business Procedures**

**Load Resource Qualification**

**Non-Controllable Load Resource**

**Qualification and Testing Procedure**

**Version 1.2**

**June 10, 2023**

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Document Approvals

|  |  |  |
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# Introduction

## Purpose

This document contains the procedures for how ERCOT Staff will process applications for Non-Controllable Load Resources (NCLRs) that register to provide Ancillary Services to the ERCOT Market. A separate business procedure governs the qualification and testing of Controllable Load Resources (CLRs). NCLRs that are covered by this business procedure are those Loads that meet the requirements in the Protocols to register and qualify to provide Responsive Reserve Service (RRS), Non-Spinning Reserve Service (NSRS) and ERCOT Contingency Reserve Service (ECRS). This procedure is intended to provide the detailed instructions that will be used to initially test the operability of NCLRs to provide those services and to document the results of any testing that is conducted by ERCOT Staff. Once qualified, NCLRs are subject to periodic testing that is specified in the ERCOT Protocols and Operating Guides, and this procedure is intended to implement those requirements too.

## Protocols References Summary

|  |  |
| --- | --- |
| ERCOT Protocols  affected Sections | [3.17 Ancillary Service Capacity Products](#_Toc205092644)  [3.17.2 Responsive Reserve Service](#_Toc205092646)  [3.17.3 Non-Spinning Reserve Service](#_Toc205092647)  3.17.4 ERCOT Contingency Reserve Service  [3.18 Resource Limits in Providing Ancillary Service](#_Toc205092648)  8.1.1.1 Ancillary Service Qualification and Testing  8.1.1.2 General Capacity Testing Requirements  8.1.1.2.1 Ancillary Service Technical Requirements and Qualification Criteria and Test Methods  8.1.1.2.1.2 Responsive Reserve Service Qualification  8.1.1.2.1.3 Non-Spinning Reserve Qualification  8.1.1.2.1.7 ERCOT Contingency Reserve Service Qualificiation  8.1.1.4 QSE Ancillary Service Energy Deployment Compliance Criteria  8.1.1.4.2 Responsive Reserve Energy Deployment Criteria  8.1.1.4.3 Non-Spinning Reserve Service Energy Deployment Criteria  8.1.1.4.4 ERCOT Contingency Reserve Service Energy Deployment Criteria |
|  |  |

## Operating Guide References

|  |  |
| --- | --- |
| [ERCOT](http://www.ercot.com/services/programs/load/eils/index.html) Operating Guide  Affected Sections | 2.3.1 Responsive Reserve  2.3.1.2 Additional Operational Details for Responsive Reserve Providers  2.3.2 Non-Spinning Reserve Service  2.3.2.1 Additional Operational Details for Non-Spinning Reserve Service Providers  2.33.3.1 Additional Operating Details for ERCOT Contingency Reserve Service (ECRS) Providers  3.4 Load Resource Testing Requirement  8 Attachments  8G Load Resource Tests |

## Acronyms

ECRS ERCOT Contingency Reserve Service

IDR Interval Data Recorder

MIS Market Information System

NOIE Non-Opt-In Entity

NSRS Non-Spinning Reserve Service

QSE Qualified Scheduling Entity

RIOO Resource Integration and Ongoing Operations

RRS Responsive Reserve Service

SAMR Special Action Modeling Request

TAC Technical Advisory Committee

UFR Under-Frequency Relay

VDI Verbal Dispatch Instruction

XML eXtensible Markup Language

Initial Qualification

## Resource Asset Registration

Resource Entities must first register their NCLRs using the RIOO application. The Demand Integration team will coordinate with other affected departments, including Network Modeling, EMMS Production Support, Data Aggregation and Wholesale Client Services, to ensure that the Load Resource Registration information is valid.

## One Line Diagrams and Drawings

Resource Entities must submit a simplified one-line diagram that shows the NCLR, associated interconnecting hardware and a brief description of the type of load to ERCOTLRandSODG@ercot.com. The Demand Integration team will review that drawing and ensure that it contains at a minimum:

* Load Type, Name and Rated Capacity
* Interrupting Device (Circuit Breaker, Oil Switch, etc)
* UFR Type, Manufacturer, and Serial Number (if applicable)
* 15-minute meter with ESIID
* Transformer, including High and Low Voltages
* Substation Name and TDSP
* Feeder and Bus IDs

## Under-frequency Relay Requirements and Testing

NCLRs that are being registered to provide service for RRS are required to have an Under-frequency Relay (UFR). The UFR is required to be set so that it will initiate the trip of the load that it controls for frequency excursions below 59.7 hz with a delay time of no greater than 20 cycles. NCLRs are required to have these relays tested prior to being put in service and must submit a Relay Test Report showing the results of that testing. The test report shall show:

* Name, Manufacturer and Serial Number for the Relay
* Test Equipment Used to Test the Relay
* Date of the Test
* Settings for the Relay
* As Found Test Results
* As Left Test Results
* Name of the Person Performing the Test

## Provisional Qualification of Load Resources

Resource Entities may request that their NCLRs be provisionally qualified to provide one or more Ancillary Services. To request provisional qualification the Resource Entity must submit an Affidavit Requesting Provisional Qualification appropriate to the Service they intend to provide (RRS, ECRS or NSRS). The Affidavits specific to each of these services are attached to this procedure. The Provisional Qualification will be good for 90 days from the time it is approved and issued. During the provisional qualification period the NCLR will be required to perform an NCLR Qualification Test for the Services they plan to provide. The Demand Integration Team will review the application to ensure that it is complete. The following checklist will be used to determine whether a Provisional Qualification will be approved.

* Resource Entity (RE) Registration is complete and has been filed with ERCOT Legal
* QSE Acknowledgement is complete and on file with Legal
* Partnerships established in ERCOT Settlements Systems between the RE and QSE. The partnership is required to be in place at least 45 days prior to the provisional qualification start date.
* RIOO submission is complete and has been submitted using a Digital Certificate for the Resource Entity.
* Telemetry is in place and tested from the QSE to ERCOT showing:
* Load Resource net real power consumption (in MW)
* Any data mutually agreed to by ERCOT and the QSE to adequately manage system reliability
* Load Resource breaker status
* LPC (in MW)
* MPC (in MW)
* Ancillary Service Schedule (in MW) for each quantity of RRS, ECRS and Non-Spin
* Ancillary Service Resource Responsibility (in MW) for each quantity of RRS, ECRS and Non-Spin for the Load Resource
* The status of the high-set UFR Resource Status (Resource Status shall be ONRL if the LR is providing RRS or Non-Spin). If the NCLR is only providing ECRS the Resource Status Code will be ONECL.
* Affidavit for provisional qualification of Loads to provide RRS, ECRS and/or Non-Spin is executed and provided to the ERCOT Demand Integration Team.

Once the NCLR is in the model, the Demand Integration Team will review the telemetry and confirm all telemetry appears to be active and functioning correctly. At this point the NCLR will have met all its initial set up and qualification requirements for a provisional qualification for RRS, ECRS and/or Non-Spin. The Demand Integration Team will notify key personnel in System Operations, Wholesale Client Relations, Settlements and Data Aggregation that the NCLR has been provisionally qualified to provide RRS and/or NSRS in the ERCOT Ancillary Services Markets. They will also notify the Resource Entity and QSE that the NCLR has been provisionally qualified. The Demand Integration Team will update the Master Load Resource Qualification Spreadsheet showing the key operating parameters for the Resource.

## Qualification Testing for new Load Resources

Once the NCLR is completely set up in the EMS and MMS Systems, the QSE is responsible for scheduling a Qualification Test by coordinating with the Resource Entity and ERCOT’s Demand Integration Team. The QSE will select a day to perform the test and provide an 8-hour window for ERCOT to perform the Qualification Test. If the NCLR is operating under a Provisional Qualification, the Qualification Test must be successfully completed within 90 days of the Provisional Qualification being active in the ERCOT market systems. Failure of the resource to complete the qualification test within 90 days will result in forfeiture of its provisional qualification status. The Qualification Test is an Actual Interruption Test and the NCLR will be expected to shed at least 95% of its telemetered Load in order to pass the Qualification Test.

The QSE is expected to have the Load Resource ready for the test and if on a provisional qualification, it should be on-line and showing a responsibility for the Ancillary Service being provided. If not provisionally qualified, the ERCOT test coordinator will provide instructions in advance and call the QSE to have it set up the telemetry so that it can be dispatched via XML instruction. The testing has slight variations depending on whether the NCLRs are being qualified for RRS, ECRS or Non-Spin. In each case, the test coordinator will work with the Shift Supervisor and the Resource Desk Operator to put the AS Deployment Manager into test mode and then issue a deployment instruction via an XML message. Note that the deployed capacity value may include any additional reserve capacity that the Resource was carrying above it’s AS Responsibility; up to 150% of its AS Responsibility.

**Non-Controllable Load Resource Qualification Test Procedure Script for Load Resources with Hi-Set Under-Frequency Relays that are active if the test is for Responsive Reserve Service or ERCOT Contingency Reserve Service.**

Sample script for the test deployment instruction

“This is (first and last name of the testing coordinator) with ERCOT System Operations. I want to confirm that you received an XML deployment instruction for (name the Dispatch Asset Code(s)). Wait for response. If yes, I am issuing a verbal instruction to (name of the QSE) to deploy the Load Resource(s), (list the NCLRs by Dispatch Asset Code). Please repeat the instruction back to me for confirmation; pause for the repeat back from the QSE Operator. That’s correct and we’ll use the following time for the official start time for the deployment (give time as hr:mm:ss).”

For RRS and ECRS allow about 45 minutes for the deployment ramp time and the sustained response period and then get ready to recall the Resource(s). Call the ERCOT Resource Desk Operator and have them issue an XML Recall Instruction using the AS Deployment Manager. Confirm the instruction went out and then have the Operator put the AS Deployment Manager back into its normal operations mode.

Sample script for the test recall instruction

This is (first and last name of the testing coordinator) with ERCOT System Operations. I want to confirm that you received an XML recall instruction for (name the Dispatch Asset Code(s)). Wait for response. (If yes) I am issuing a verbal instruction to (name of the QSE) to recall the Load Resource(s), (list the NCLRs by Dispatch Asset Code). Can you please give me the repeat back for the instruction. (Pause for the repeat back from the QSE Operator.) That’s correct and we’ll use the following time for the official recall notification time for the deployment (give time as hr:mm:ss).”

Pull data from the PI historical database and complete the test results form. The NCLR response will measure the NCLRs pre-deployment baseline load average over a 5-minute interval prior to the instruction going out, compared to the 1-minute average load 10 minutes after the verbal instruction was issued. The response needs to be greater than 95% of the dispatch instruction MW value to pass the test. The NCLR also needs to change the AS Schedule within 1 minute of the instruction going out. The third aspect of the test is that the NCLR must maintain the response through the entire sustained response period.

If the NCLR successfully deploys within the 10-minute timeline, the Demand Integration Team will notify key personnel in System Operations, Wholesale Client Relations, and ERCOT Market Support Services that the NCLR has been fully qualified to provide RRS or ECRS in the ERCOT Ancillary Services Markets. They will also notify the Resource Entity and QSE that the NCLR has been fully qualified.

The NCLR will be deemed to have failed the Qualification Test if it fails to deploy its Load within 10 minutes, fails to have a response capacity value of at least 95% of the instructed value, does not show a schedule change within 1 minute of the instruction being issue or does not maintain the response through its sustained response period. If the Load Resource was operating under a Provisional Qualification, the Provisional Qualification will be revoked and the QSE informed that the Load Resource will not be allowed to participate in Market Activities until it has successfully passed a Qualification Test.

**NCLR Qualification Test Procedure for Load Resources that intend to qualify for Non-Spinning Reserve Service.**

There is no verbal dispatch instruction associated with a Non-Spin deployment; there is only an XML deployment instruction for the initial deployment, periodic redeployment instruction and then an instruction to recall the NCLR at the end of the deployment. The telemetry for the underfrequency relay must be showing that the UFR is disabled or not armed. Coordinate with the Shift Supervisor to get permission to do the test and then call the ERCOT Resource Desk Operator. When deploying an NCLR for Non-Spin qualification, the AS Deployment Manager should be put in test mode with the redeployment using the COP look-ahead function enabled. Request that the Operator select the NCLR(s) to be test and confirm that the AS Deployment Manager configuration is set up correctly. Have they Operator issue the instruction(s). Leave the NCLR(s) deployed for about one hour and then have the Operator recall the NCLR(s) and put the AS Deployment Manager back into normal Operation.

Pull data from the PI historical database and complete the test results form. The NCLR response will measure the NCLRs pre-deployment baseline load average over a 5-minute interval prior to the instruction going out, compared to the 1-minute average load 30 minutes after the verbal instruction was issued. The response needs to be greater than 95% of the dispatch instruction MW value to pass the test. The NCLR also needs to change the AS Schedule within one minute of the instruction going out. The third aspect of the test is that the NCLR must maintain the response through the entire sustained response period.

If the NCLR successfully deploys within the 30-minute timeline, the Demand Integration Team will notify key personnel in System Operations, Wholesale Client Relations, and ERCOT Market Support Services that the NCLR has been fully qualified to provide Non-Spinning Reserve Service in the ERCOT Ancillary Services Markets. They will also notify the Resource Entity and QSE that the NCLR has been fully qualified.

The NCLR will be deemed to have failed the Qualification Test if it fails to deploy its Load within 30 minutes, fails to have a response capacity value of at least 95% of the instructed value, does not show a schedule change within 1 minute of the instruction being issue or does not maintain the response through its sustained response period. If the Load Resource was operating under a Provisional Qualification, the Provisional Qualification will be revoked and the QSE informed that the Load Resource will not be allowed to participate in Market Activities until it has successfully passed a Qualification Test.

# Periodic Testing and Recertification of Load Resources

## Annual Telemetry Testing

All Load Resources are subject to an annual test of the telemetry associated with that Load Resource. The telemetry test will be based on the actual operation of the Load Resource and include a verification of the telemetry attributes. QSEs are allowed to use an actual Load Resource deployment to confirm that their telemetry is in agreement with the ERCOT system values. The results of this test will be documented on the Annual Telemetry Test Report shown in Section 4.4 of this procedure.

## Biennial Recertification of Load Resources

All NCLRs with Hi-Set Under-Frequency Relays will be required to have their UFRs tested every two years to verify that the relays are set correctly and will trip the NCLR if they are armed and see a frequency disturbance in which the frequency goes below 59.7 Hz for more than 20 cycles. If the relay responds to an actual frequency event and the Load trips as expected, that event may be used in lieu of an actual test of the relay. The results of this testing will be documented on the Biennial Test Report for NCLR Under-Frequency Relays (UFRs) shown in Section 4.5 of this procedure.

## Annual Recertification Testing of Load Resources

All NCLRs that are qualified to provide RRS and NSRS will be subject to an annual recertification test. If an NCLR has performed satisfactorily to a Load Resource deployment that was initiated by a Verbal Dispatch Instruction that performance may be used in lieu of an actual interruption test. The results of the testing will be documented on the Load Resource Qualification Test Report indicating that the test type was an Annual Recertification Test. That test report is shown in Section 4.2 of this Procedure.

# Change Control and Retirement of Load Resources

## Change Control for Load Resources

If a Resource Entity makes a significant change to a Load Resource, it is required to submit a revision in RIOO indicating what changes are being proposed. Depending on the nature of the change, the Resource Entity may need to submit a new one-line diagram and UFR test reports.

Demand Integration staff will coordinate with EMS Production Support and the Network Modeling groups to update the EMS and Network Operations Modeling systems. If the change involves a substantial revision to the Net Dependable Capability of the Load Resource, a Qualification Test may be required to confirm the new Maximum Power Consumption value for the Load Resource.

## Retirement of Load Resources

When a Load Resource decides to discontinue participation in the ERCOT Ancillary Service Market, its Resource Entity will submit a revision to RIOO that will indicate a new stop date for the Load Resource. Demand Integration staff will coordinate with the EMS, Network Model and Settlements staff to remove the Load Resource from the ERCOT software systems.

# Documentation and Reports

## Request for Provisional Qualification and Affidavit

Insert links to Provisional Qualification Request for:

RRS - <https://www.ercot.com/files/docs/2023/06/08/affidavit-provisional-qualification-rrs.doc>

ECRS - <https://www.ercot.com/files/docs/2023/06/08/affidavit-provisional-qualification-for-ecrs.doc>

NSRS - <https://www.ercot.com/files/docs/2023/06/08/affidavit-provisional-qualification-for-nsrs.doc>

## Load Resource Qualification Test Report

RESULTS of LOAD RESOURCE ANCILLARY SERVICE TESTING

Test Date**:** Asset Code:

Customer Common Name for the Load Resource:

Resource Entity: QSE:

TDSP:

Transmission Substation name:

Registered Capacity (MW):

Type of Ancillary Service Test:

**Pre-deployment Telemetry**

|  |  |  |
| --- | --- | --- |
|  | QSE Reported Value | ERCOT Reported Value |
| LR Net real power Flow(MW) |  |  |
| Resource Status Code |  |  |
| RRS Responsibility(MW) |  |  |
| RRS Schedule (MW) |  |  |
| ECRS Responsibility (MW) |  |  |
| ECRS Schedule (MW) |  |  |
| NSRS Responsibility (MW) |  |  |
| NSRS Schedule (MW) |  |  |
| MPC |  |  |
| LPC |  |  |
| Breaker Status |  |  |
| UFR Status |  |  |

Time for XML Deployment Instruction from ERCOT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Time for Verbal Dispatch Instruction from ERCOT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Post-deployment Telemetry**

|  |  |  |
| --- | --- | --- |
|  | QSE Reported Value | ERCOT Reported Value |
| LR Net real power Flow(MW) |  |  |
| Resource Status Code |  |  |
| RRS Responsibility(MW) |  |  |
| RRS Schedule (MW) |  |  |
| ECRS Responsibility (MW) |  |  |
| ECRS Schedule (MW) |  |  |
| NSRS Responsibility (MW) |  |  |
| NSRS Schedule (MW) |  |  |
| MPC |  |  |
| LPC |  |  |
| Breaker Status |  |  |
| UFR Status |  |  |

LR Schedule Change within 1 minute: Pass Fail

LR Deploys within 10 minutes of VDI: Pass Fail

LR Remains Deployed during Entire Deployment Period: Pass Fail

LR Time of Recall XML Instruction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

LR Time of Recall Verbal Dispatch Instruction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Time Load Restored to Pretest Conditions: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Limiting Factors if Any: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ERCOT Operator Ordering test: \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

QSE Representative Initiating Load Shed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

LR Authorized Representative: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Qualification Test Affidavit

**STATE OF TEXAS §**

**§**

**COUNTY OF TRAVIS §**

**AFFIDAVIT**

**Load Qualification Tests for Load Resources providing Responsive Reserve Service (RRS) or ERCOT Contingency Resource Service (ECRS) or Non-Spinning Reserve Service**

**BEFORE ME,** the undersigned authority, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, being first duly sworn, deposes and states:

1. “My name is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I am over the age of twenty-one and am competent to make the following statements.
2. I am employed as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, having its principal place of business at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. I have reviewed and fully understand the Load Resource Ancillary Service Qualification Test Procedures that govern load participation in the ERCOT Ancillary Service Markets.
4. I herby affirm and certify that the method used to dispatch and shed the load as part of that test is consistent with the method that will be used during an actual deployment of the Load Resource named \_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. I hereby affirm and certify that the facilities described in the Resource Entity’s Asset Registration, One-line diagram and if applicable the Under-Frequency Relay Test Report; attached hereto are to the best of my knowledge in compliance with all requirements specified in the ERCOT Protocols and Operating Guides.
6. The test results are attached to this Affidavit and represent an accurate assessment of the testing that was conducted and are a part of this Qualification Test documentation.

The foregoing statements offered by me are true and correct and the opinions stated therein are, in my judgment and based upon my professional experience, true and correct.”

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Affiant

**SUBSCRIBED AND SWORN TO BEFORE ME** on this \_\_\_\_\_\_ day of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 200\_\_, by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Affiant named herein.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notary Public, State of Texas

## Annual Telemetry Test Report

This test report is located in the ERCOT Nodal Operating Guides under Section 8G-1.

## Biennial Test for Non-Controllable Load Resource Under-Frequency Relays (UFRs)

This test report is located in the ERCOT Nodal Operating Guides under Section 8G-2.