# RESOURCE ASSET REGISTRATION FORM (RARF) WORKSHOP

**LOAD RESOURCES**

**March 20, 2008**

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# AGENDA

## LOAD RESOURCES

# RESOURCE REGISTRATION WORKSHOP AGENDA

- **Introduction**
- **Review New Form**
- **General Information and Ownership**
- **Operational Resource Parameters**

# INTRODUCTION

- **Load Resource (formerly known as "Load Acting as a Resource" or LaaR)**
  – A load capable of providing Ancillary Services (AS) to ERCOT system and is registered with ERCOT as a Load Resource

- **Types of Load Resources in the ERCOT Nodal Market**
  – Under Frequency Relay (UFR)
  – Controllable Load Resource (CLR)
  – Interruptible Load

- **Load Resources:**
  – Must be individually registered with ERCOT by ESI-ID
  – Are subject to qualification testing administered by ERCOT

- **Under Frequency Relay (UFR) Load Resources**
  - Eligible to provide Responsive Reserve Service (RRS) and Non-Spinning Reserve (NSRS)
  - Load Resources controlled by high-set UFRs
  - When providing RRS, must provide telemetered output signal, including breaker status and status of UFR

- **Controllable Load Resources (CLR)**
  - Load Resource capable of controllably reducing or increasing consumption under dispatch control (similar to AGC)
  - Immediately responds proportionally to frequency changes
  - Eligible to provide the following services: Regulation-Up Reserve, Regulation-Down Reserve, Responsive Reserve (RRS), and Non-Spinning Reserve (NSRS)

- **Interruptible Load Resources**
  - Eligible to provide Non-Spinning Reserves (NSRS) only

- **Load Resources may not provide Ancillary Services simultaneously as a CLR and UFR**

# NEW FORM - SAMPLE

# NEW FORM – RESOURCE ASSET REGISTRATION FORM (RARF)

- **Uses hyperlinks to move between tabs**
  - Each worksheet has a link to "Return to Map"

- **Will provide references to the "New RARF" Guide and applicable Nodal Protocols**

- **Each field will be defined in the RARF or in a glossary**

- **Watch "ResourceRegistration" emails for details on submittal changes, file postings, schedule updates, etc.**

Resource Registration

# NEW RARF – MAP AND NAVIGATION

**Map of the ERCOT Nodal Resource Asset Registration Form**

*This worksheet tab identifies the necessary worksheets and provides links to the pages.*

| Worksheets included in this form: | Used by: | Links to Worksheet Tab: | RARF Guide / Protocol Reference |
|---|---|---|---|
| Instructions | All Generation and Load Resources | *Instructions* | RARF Guide: Section X |
| Spreadsheet Map (this page) | All Generation and Load Resources | *Map (this page)* | RARF Guide: Section X |
| General Information | All Generation and Load Resources | *General Information - ALL* | RARF Guide: Section X |
| Site Information | All Generation Resources | *Site Information - GEN CC WIND* | |
| Unit Information | All Generation Resources except Wind or CC | *Unit Info - GEN* | RARF Guide: Section X |
| | All Combined Cycle Resources | *Unit Info - CC* | |
| | All Wind Resources | *Unit Info - WIND* | |
| Resource Parameters | All Generation Resources except Wind or CC | *Resource Parameters - GEN* | RARF Guide: Section X |
| | All Combined Cycle Resources | *Resource Parameters - CC* | |
| | All Combined Cycle Resources | *Resource Parameters - CC CFG* | |
| | All Wind Resources | *Resource Parameters - WIND* | |
| Operational Resource Parameters | All Generation Resources except Wind or CC | *Operational Resource Parameters - GEN* | RARF Guide: Section X Nodal Protocols 3.7.1 |
| | All Combined Cycle Configurations | *Operational Resource Parameters - CC CFG* | |
| | All Wind Resources | *Operational Resource Parameters - WIND* | |
| Reactive Capability | All Generation Resources except Wind or CC | *Reactive Capability - GEN* | RARF Guide: Section X |
| | All Combined Cycle Resources | *Reactive Capability - CC* | |
| | All Wind Resources | *Reactive Capability - WIND* | |
| GSU Transformer | All Generation Resources | *GSU Transformer - ALL* | RARF Guide: Section X |
| Ownership | All Generation Resources except Wind or CC | *Ownership - GEN* | RARF Guide: Section X |
| | All Combined Cycle Resources | *Ownership - CC* | |
| | All Wind Resources | *Ownership - WIND* | |
| Combined Cycle Configuration Details | All Combined Cycle Resources - Train 1 | *Configurations - CC1* / *Transitions - CC1* | RARF Guide: Section X |
| | All Combined Cycle Resources - Train 2 | *Configurations - CC2* / *Transitions - CC2* | |
| | All Combined Cycle Resources - Train 3 | *Configurations - CC3* / *Transitions - CC3* | |
| Planning | All Generation Resources except Wind | *Planning - GEN* | RARF Guide: Section X |
| | All Wind Resources | *Planning - CC* | |
| | | *Planning - WIND* | |
| | All Generation Resources | *Protection - GEN* | |
| | | *Protection - CC* | |
| | | *Protection - WIND* | |
| | All Generation Resources except Wind | *Subsynchronous Resonance - GEN* | |
| | | *Subsynchronous Resonance - CC* | |
| Private Use Network | All Private Use Networks | *Private Network - PUN* | RARF Guide: Section X |
| Generation Owned Transmission Assets | All Generation Resources | *Generation Owned Transmission Assets - ALL* | RARF Guide: Section X |
| Load Resource Information | All Load Resources | *Load Resource Information* | RARF Guide: Section X |
| Load Resource Parameters | All Load Resources | *Load Resource Parameters* | |

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Resource Registration

Resource Registration

# NEW RARF

| | | **RETURN TO MAP** | | |
|---|---|---|---|---|

**Load Resource Information Tab**

*This worksheet tab provides information for Load Resources.*

*Please complete this section and select RETURN TO MAP*

| | **Unit Details** | Labels | **Load Point #1** | **Load Point #2** | **Load Point #3** |
|---|---|---|---|---|---|
| **LOAD RESOURCES** | Unit Name | | | | |
| | Name of End Use Customer | | | | |
| | Common Name for Load  Resource | | | | |
| | Physical Street Address for point of Delivery (POD) | | | | |
| | Name of City for Point of Delivery (POD) | | | | |
| | Is Load Netted From Generation at ERCOT Read Gensite? (Y/N) | Y/N | | | |
| | Is Load Behind a NOIE Settlement Meter Point? (Y/N) | Y/N | | | |
| | Load Resource Type (CLR/UFR/Interruptible) | | | | |
| | If CLR, will CLR be Dynamically Scheduling? (Y/N) | Y/N | | | |
| | **Dispatch Asset Code (provided by ERCOT)** | | | | |
| | Load Resource Effective Date | | | | |
| | Load Resource Expiration Date | | | | |
| | Substation Name for POD | | | | |
| | Substation Code for POD | | | | |
| | ESIID Station Name | | | | |
| | ESIID Station Code | | | | |
| | Transmission Bus POD (PTI Bus No) | | | | |
| | Voltage Level of Telemetered load(s) | KV | | | |
| | Meter Reading Entity (TDSP) | | | | |
| | Meter Reading Entity Duns Number | | | | |
| | QSE Name | | | | |
| | QSE Duns Number | | | | |
| | ESI-ID assigned to meter | | | | |
| | Wholesale Delivery Point? (Y/N) | Y/N | | | |
| | Notice Requirements to Interrupt | | | | |
| | High Set Under-frequency Relay (UFR) Setting | Hz | | | |
| | Load Resource Control Device | | | | |
| | If CLR, ability to operate as a UFR type Resource? | Y/N | | | |
| | ERCOT Load Zone | | | | |
| | Maximum POD Total Load | MW | | | |
| | Summer Interruptible MW | MW | | | |
| | Winter Interruptible MW | MW | | | |
| | High Reasonability Limit | MW | | | |
| | Low Reasonability Limit | MW | | | |
| | CLR High Reasonability Ramp Rate Limit | MW/min | | | |
| | CLR Low Reasonability Ramp Rate Limit | MW/min | | | |
| | Private Use Network? | Y/N | | | |

Resource Registration

# GENERAL INFORMATION AND OWNERSHIP

| Date Form Completed: | |
|---|---|
| Resource Entity Submitting Form: | |
| Resource Entity DUNS # | |

- **Submittal Information**
  - Date format shall be MM/DD/YYYY
  - Resource Entity name must match ERCOT's record
  - DUNS number is either a 9 digit or 13 digit number

- **Resource Entity Authorized Representative**
  - Name as registered with ERCOT
  - Responsible for certifying and submitting the RARF to ERCOT

- **Primary Contact**
  - Resource Entity contact for Load Resources
  - May also be the Authorized Representative

Resource Registration

# LOAD RESOURCE INFORMATION

# LOAD RESOURCE INFORMATION

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Name of End Use Customer | | | |
| Common Name for Load Resource | | | |
| Physical Street Address for point of Delivery (POD) | | | |
| Name of City for Point of Delivery (POD) | | | |

- **Name of End Use Customer**
  - Enter the company name of customer registered as a Load Resource

- **Common Name for Load Resource**
  - Enter the common name of the load that will be acting as a Load Resource  (e.g., South Gulf Refinery, etc.)

- **Physical Street Address for Point of Delivery (POD)**
  - Enter the physical address of the Load Resource.  Use the street address if known. Use Farm Road reference points or other identification if address is not specific

- **Name of City for Point of Delivery (POD)**
  - Enter the name of the nearest Texas city or town where POD is located (e.g., Kyle)

Resource Registration

# LOAD RESOURCE INFORMATION

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Is Load Netted From Generation at ERCOT Read Gensite? (Y/N) | | | |
| Is Load Behind a NOIE Settlement Meter Point? (Y/N) | | | |
| Load Resource Type (CLR/UFR/Interruptible) | | | |
| If CLR, will CLR be Dynamically Scheduling? (Y/N) | | | |

- **Is Load Netted From Generation at ERCOT Read Gensite? (Y/N)**
  - Enter Y or N to indicate whether or not the Load Resource is netted from the Generation at the ERCOT-read Gensite

- **Is Load Behind a NOIE Settlement Meter Point? (Y/N)**
  - Enter Y or N to indicate if Load Resource is behind a NOIE Settlement Meter Point.
  - If "Y", NOIE shall provide an alternative unique descriptor of the qualified Load Resource for ERCOT's records

- **Load Resource Type (CLR/UFR/Interruptible)**
  - Enter the load type. There are 3 types of Loads that can act as Resources: Controllable Load Resource (CLR), Interruptible Load, and Under-Frequency Relays (UFR)

- **If CLR, will CLR be Dynamically Scheduled? (Y/N)**
  - Enter Y or N to indicate whether or not CLR will be Dynamically Scheduled (i.e., DSR)

# LOAD RESOURCE INFORMATION

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Dispatch Asset Code (provided by ERCOT) | | | |
| Load Resource Effective Date | | | |
| Load Resource Expiration Date | | | |
| Substation Name for POD | | | |
| Substation Code for POD | | | |

- **Dispatch Asset Code (provided by ERCOT)**
  - Enter the Dispatch Asset Code as provided by ERCOT

- **Load Resource Effective Date**
  - Enter the date the Load Resource was placed in service (in MM/DD/YYYY format)

- **Load Resource Expiration Date**
  - Enter the date the Load Resource was removed or will be removed from service (in MM/DD/YYYY format).

- **Substation Name/Substation Code for POD**
  - Enter the name and code of the substation that supplies service to the POD of the load
  - Breckenridge Substation would be BRKRG

# LOAD RESOURCE INFORMATION

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| ESIID Station Name | | | |
| ESIID Station Code | | | |
| Transmission Bus POD (PTI Bus No) | | | |
| Voltage Level of Telemetered load(s) | | | |

- **ESI ID Station Name**
  - Enter the station name associated with the ESI ID that will be utilized. ESI ID is the Electric Service Industry Identifier (ESI ID) as assigned by the TDSP.

- **ESI ID Station Code**
  - Enter the station code associated with the ESI ID that will be utilized.

- **Transmission Bus POD (PTI Bus No.)**
  - Enter the transmission bus location by bus number or by specifying the transmission line (i.e., Luling to Gonzales 138KV, etc.).

- **Voltage Level of Telemetered Load(s)**
  - Enter the voltage level of the load at the transmission voltage level
  - Typically, this range is 69KV or higher.

Resource Registration

# LOAD RESOURCE INFORMATION

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Meter Reading Entity (TDSP) | | | |
| Meter Reading Entity Duns Number | | | |
| QSE Name | | | |
| QSE Duns Number | | | |

- **Meter Reading Entity**
  - Enter the name of the Meter Reading Entity responsible for reading the meter of the Load Resource
  - ERCOT Polled Settlement (EPS) meters will reflect ERCOT as the MRE

- **Meter Reading Entity Duns Number**
  - Enter the DUNS number of the Meter Reading Entity (MRE) providing the meter reading services. This is either a 9 or a 13 digit number
  - ERCOT Polled Settlement (EPS) meters will reflect the ERCOT Duns number

- **QSE Name**
  - Enter the name of the Qualified Scheduling Entity representing the Load Resource

- **QSE DUNS Number**
  - Enter the DUNS number of the QSE representing the Resource Entity.
  - This is either a 9 or a 13 digit number

Resource Registration

# LOAD RESOURCE INFORMATION

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| ESI-ID assigned to meter | | | |
| Wholesale Delivery Point? (Y/N) | | | |
| Notice Requirements to Interrupt | | | |
| High Set Under-frequency Relay Setting (Hz) | | | |

- **ESI-ID assigned to meter**
  - Enter the ESI-ID assigned to the Load Resource

- **Wholesale Delivery Point? (Y/N)**
  - Enter "Y" or "N" if the POD is a Wholesale delivery point or not

- **Notice Requirements to Interrupt**
  - Enter the pre-interruption notice requirement in minutes for the Load Resource. This value should correlate to the type of service being registered: UFR = Instantaneous; CLR = 10 min; ILR = 30 min.

- **High Set Under-Frequency Relay Setting (Hz)**
  - Enter the High Set Under-Frequency Relay setting in Hz. A non-CLR Load Resource providing Responsive Reserve Service must have a high set UFR set no lower than 59.7 Hz with a delay of no more than 20 cycles (1/3 second)

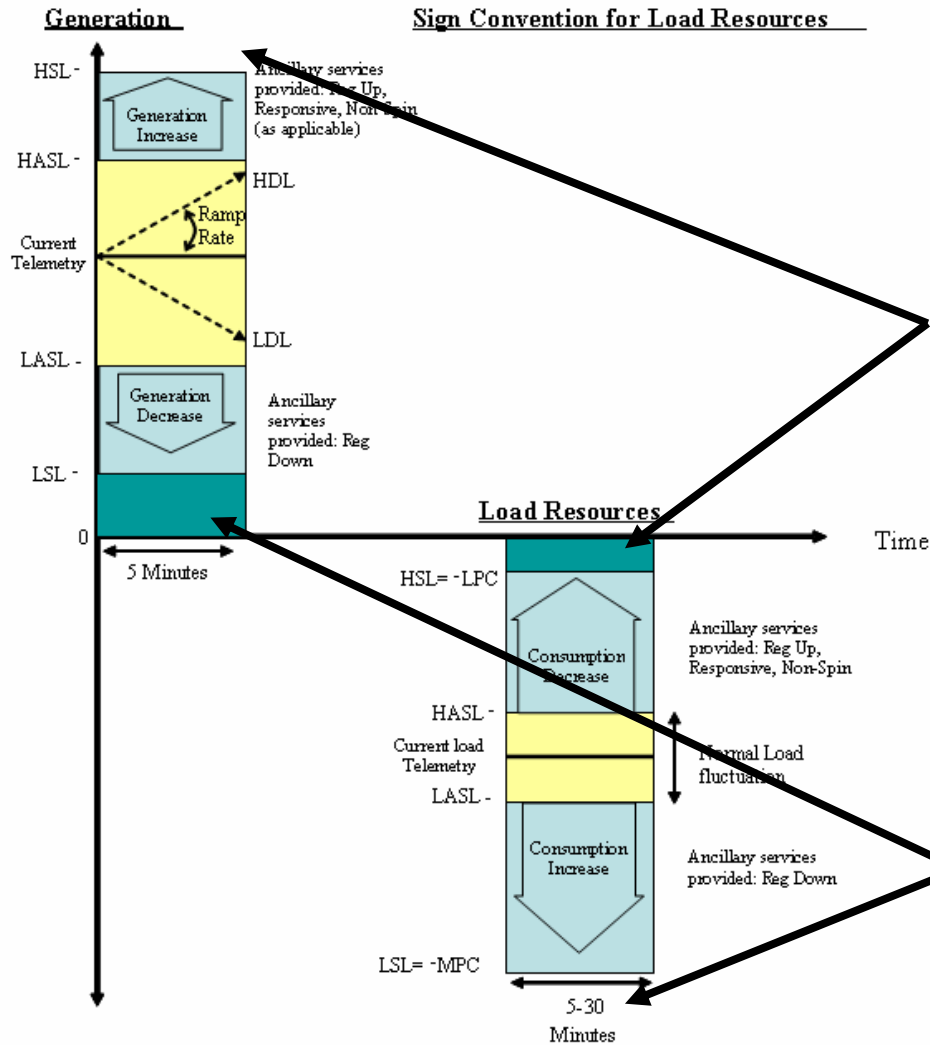| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Load Resource Control Device (Control Technology / | | | |
| If CLR, ability to operate as a UFR type Resource? (Y/N) | | | |
| ERCOT Load Zone | | | |
| Maximum POD Total Load | | | |
|     Summer (Interruptible MW) | | | |
|     Winter (Interruptible MW) | | | |

- **Load Resource Control Device (Control Technology/Interruptible Switch/CB)**
  - Enter the type of interrupting device to isolate the Load Resource from the ERCOT grid (e.g., SF-6 Circuit Breaker, OCB, Disconnect Switch, etc.)

- **If CLR, ability to operate as a UFR type Resource? (Y/N)**
  - Enter "Y" if the LR is switchable from CLR to Non-CLR providing RRS
    - Must complete all sections for both Load Resource types
  - Enter "N" if it is a CLR only

- **ERCOT Load Zone**
  - Enter the ERCOT Load Zone where the Load Resource is physically located

- **Maximum POD Total Load (Summer and Winter Interruptible MW)**
  - Enter the maximum total load at the POD plus the interruptible Load for both summer and winter

Resource Registration

| Field Description | | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|---|
| High Reasonability Limit ▓▓▓▓▓▓ | | | | |
| Low Reasonability Limit (▓▓▓▓▓▓ | | | | |

- **High Reasonability Limit**
  - An "Out-of-Bounds" value chosen by the RE and used by ERCOT for validation purposes
  - Greater than or equal to HSL or -LPC

- **Low Reasonability Limit**
  - An "Out-of-Bounds" value chosen by the RE and used by ERCOT for validation purposes
  - Less than or equal to LSL or –MPC

HRL "above" HSL

HRL >= HSL = -LPC

LRL "below" LSL

LRL <= LSL = -MPC

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| CLR High Reasonability Ramp Rate Limit (Max ramp MW/min) | | | |
| CLR Low Reasonability Ramp Rate Limit (Min ramp MW/min) | | | |

- **CLR High Reasonability Ramp Rate Limit (Max ramp MW/min)**
  - An "Out-of-Bounds" maximum value chosen by RE and used by ERCOT for validation purposes
  - Applies to CLRs only
  - Should be entered as a positive number

- **CLR Low Reasonability Ramp Rate Limit (Min ramp MW/min)**
  - An "Out-of-Bounds" minimum value chosen by RE and used by ERCOT for validation purposes
  - Applies to CLRs only
  - Should be entered as a positive number

Resource Registration

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Private Use Network (Y/N)? | | | |

- **Private Use Network (Y/N)?**
  - Enter "Y" or "N" to indicate whether or not the Load Point is located within a Private Use Network (PUN) Generation Resource

  - Definition of Private Use Network (PUN), per Nodal Protocols Section 2:
    "An electric network connected to the ERCOT Transmission Grid that contains Load that is not directly metered by ERCOT (i.e., Load that is typically netted with internal generation)"

# OPERATIONAL RESOURCE PARAMETERS

# RESOURCE PARAMETERS (Non-CLR)

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Minimum Interruption Time | | | |
| Minimum Restoration Time | | | |

- **Minimum Interruption Time\***
  - Minimum number of consecutive hours the Load Resource can be deployed (between breaker open to breaker close)
  - Measured in hours


- **Minimum Restoration Time\***
  - Minimum number of consecutive hours the Load Resource must remain energized (not deployed) from the time the Load Resource is restored from an interruption before it is available for the next interruption
  - Measured in hours


**\* These Resource parameters are required by the Protocols for registration purposes only, and are not yet integrated into ERCOT market or operational applications.**

# RESOURCE PARAMETERS (Non-CLR)

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Max WEEKLY Deployments | | | |
| Max Interruption Time | | | |

- **Max WEEKLY Deployments \***
  - Maximum number of times the Load Resource can be deployed in a rolling seven consecutive days

- **Max Interruption Time \***
  - Maximum number of consecutive hours the Load Resource can remain deployed before it must be re-energized

**\* These Resource parameters are required by the Protocols for registration purposes only, and are not yet integrated into ERCOT market or operational applications.**

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| Max DAILY Deployments | | | |
| Max Weekly Energy | | | |
| Minimum Notice Time | | | |

- **Max Daily Deployments** *
  - Maximum number of times the Load Resource can be deployed in a day

- **Max Weekly Energy** *
  - The maximum amount of energy, in MWh, which the Load Resource can provide to the grid in the form of Load interruptions over seven consecutive days
  - Enter as a positive number

- **Minimum Notice Time** *
  - Minimum notification time the Load Resource requires prior to deployment (e.g., instantaneous, 30 minutes, etc.)
  - Enter in minutes

**\* These Resource parameters are required by the Protocols for registration purposes only, and are not yet integrated into ERCOT market or operational applications.**

# OPERATIONAL RESOURCE PARAMETERS

# RESOURCE PARAMETERS (CLR)

| Field Description | Load Point #1 | Load Point #2 | Load Point #3 |
|---|---|---|---|
| CLR Max Deployment Time | | | |
| CLR Max Weekly Energy | | | |

- **CLR Max Deployment Time**
  – Maximum amount of time a Controllable Load Resource (CLR) can be deployed before it must return to normal operating conditions
  – Measured in hours

- **CLR Max Weekly Energy**
  – Maximum amount of energy a Controllable Load Resource (CLR) can provide to the grid in the form of Load interruptions or Regulation Service in a rolling seven consecutive days
  – Measured in MWh

Resource Registration

- **CLR Normal Ramp Rate Curve**
  - Normal Ramp Rate curve in the Nodal Protocols is for curve to span from LSL to HSL
  - HSL/LSL changes daily so extend curve to High/Low Reasonability Limits (HRL/LRL) for registration purposes
  - MW1 to MW5 values are increasing MW values
  - Do not enter zero or negative Ramp Rates
  - QSEs will be able to update the ramp rates in Market Management System (MMS)

- **Ramp rates will be in the up and down directions**

- **Ten segments/steps to RR curve NEW!!**

| Field Description | Load Point #1 |
|---|---|
| CLR Normal Ramp Rate Curve | |
| MW1    (MW1/Low to MW5/High end of curve) | |
| Upward RampRate1 (MW/minute) | |
| Downward RampRate1 (MW/minute) | |
| MW2 | |
| Upward RampRate2 (MW/minute) | |
| Downward RampRate2 (MW/minute) | |
| MW3 | |
| Upward RampRate3 (MW/minute) | |
| Downward RampRate3 (MW/minute) | |
| MW4 | |
| Upward RampRate4 (MW/minute) | |
| Downward RampRate4 (MW/minute) | |
| MW5 | |
| Upward RampRate5 (MW/minute) | |
| Downward RampRate5 (MW/minute) | |

- **CLR Emergency Ramp Rate Curve**
  - Emergency Ramp Rate curve in the Nodal Protocols is for curve to span from LEL to HEL.
  - HEL/LEL changes daily so extend curve to High/Low Reasonability Limits (HRL/LRL) for registration purposes.
  - MW1 to MW5 values are increasing MW values
  - Do not enter zero or negative Ramp Rates
  - QSEs will be able to update the ramp rates in Market Management System (MMS)

- **Ramp rates will be in the up and down directions**

- **Ten segments/steps to RR curve NEW!!**

| Field Description | Load Point #1 |
|---|---|
| CLR Emergency Ramp Rate Curve | |
| MW1    (MW1/Low to MW5/High end of curve) | |
| Upward RampRate1 (MW/minute) | |
| Downward RampRate1 (MW/minute) | |
| MW2 | |
| Upward RampRate2 (MW/minute) | |
| Downward RampRate2 (MW/minute) | |
| MW3 | |
| Upward RampRate3 (MW/minute) | |
| Downward RampRate3 (MW/minute) | |
| MW4 | |
| Upward RampRate4 (MW/minute) | |
| Downward RampRate4 (MW/minute) | |
| MW5 | |
| Upward RampRate5 (MW/minute) | |
| Downward RampRate5 (MW/minute) | |

## RESOURCE PARAMETERS (CLR)

- **All ramp rate values, including downward rates, should be entered in the RARF as positive values**

- **Ramp Rates and curves are critical and must be provided for every CLR**

- **The values in the RARF are used to build the Ramp Rate step curves**

- **Ramp Rate Curves are not tools to restrain the operating range of the CLR**

- **Ramp Rate Curves are extended down to zero and up to infinity**
  - Realistically, the curves are limited to LRL and HRL
  - Further operating restrictions are done as part of the COP and telemetry

## RESOURCE PARAMETERS (CLR)

- **Decimal values are acceptable**
  - At this time, EDS testing is rounding these values. This issue is being resolved

- **If there is only one ramp rate, then only one MW value needs to be filled in**

- **If not all five MW values are used, use only MW1 through MWx as needed**
  - For example, if there are three rates, then use MW1, MW2, and MW3.

- **For the "Normal Ramp Rate Curve", does ERCOT expect to see the ramp rate from LSL to HSL?**
  - ERCOT desires the ramp rate curve at Low Reasonability Limit (LRL) to the High Reasonability Limit (HRL).

# RESOURCE PARAMETERS (CLR) – FAQ

- **For Ramp Rate Curves, the ramp rate varies in different operational scenarios, such as winter, summer etc. What does "Normal" mean?**

  - ERCOT desires the ramp rate curve from the Low Sustainable Limit (LSL) to the High Sustainable Limit (HSL) and can be entered in 5-pairs (at different MW levels).

  - If there are significant changes in operational conditions (derating, unplanned outages, seasonal configuration changes) the ramp rate curves can be updated with the QSE providing a reason code- but this should be only a few times per year.