



ERCOT Systems Response to Frequency Changes

ERCOT Staff

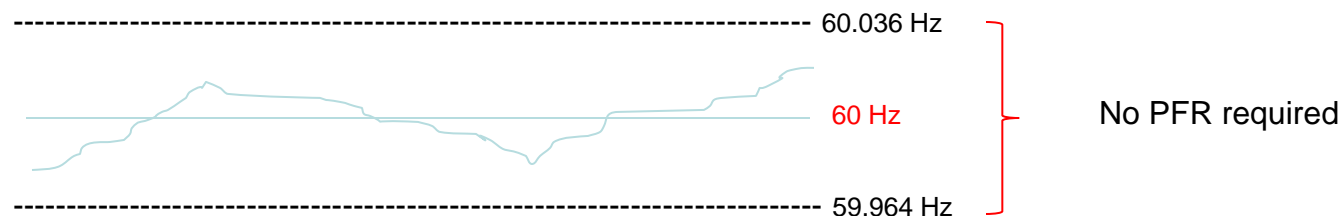
PSWG Meeting

10/01/2010

- **Primary Frequency Response**
- **Regulation Service**
- **Responsive Reserve Service**

Primary Frequency Response

- **± 0.036 Hz deadband maximum**



- **All Generators and Controllable Load Resources provide Primary Frequency Response based on 5% droop setting (10 MWs /0.1 Hz deviation based on 300 MW unit capability)**

Regulation

- **Deployed off 3 pre-defined limits (Modes)**
 1. Normal Mode – ACE exceeds 62 MWs
 2. Assist Mode – ACE exceeds 90 MWs
 3. Emergency Mode – ACE exceeds 334 MWs

- **Deployed every LFC cycle (4 seconds)**

Responsive Reserve Service

Responsive Reserve is an Ancillary Service that provides operating reserves intended to:

- Help restore system frequency within the first few seconds of a significant frequency deviation.
- Provide energy or continued Load interruption during the implementation of the Energy Emergency Alert (EEA)
- May be deployed Automatically or Manually by ERCOT System Operator

Responsive Reserve Service

ERCOT may deploy Responsive Reserve when:

- **Manually:**

- Power requirement to restore frequency within 10 minutes exceeds the Reg-Up ramping capability.
- Responding to NERC Disturbance Control requirements when no additional energy can be dispatched by SCED.
- System is under Energy Emergency Alert (EEA).

- **Automatically:**

- System frequency falls below a threshold value (59.91 Hz.).

****Deployment sends signal to QSE's to change their Resource schedules***

****Schedule change results in releasing additional energy to be deployed by SCED***

Non-Spinning Reserve Service

- ERCOT will use Non-Spin to restore capacity insufficiency.
- Deployed Manually by ERCOT System Operator.
- XML message sent to QSE's to change their Resource schedules
- Schedule change results in releasing additional energy to be deployed by SCED

Updated Desired Base Point

A calculated MW value representing the expected MW output of a Generation Resource ramping to a Base Point

- ERCOT's Load Frequency Control (LFC) algorithm provides UDBP every 4 seconds to coordinate ramping of all generation to their SCED Base Points
- ERCOT issues Reg-Up and Reg-Down deployment Dispatch Instructions over ICCP providing the change in MW output requested of the QSE Resource assuming all QSE Resources are at their Updated Desired Base Point
- If a significant frequency deviation occurs, LFC may temporarily halt ramping of UDBP if such would increase the frequency deviation

Updated Desired Base Point

