



ERCOT Generation Weatherization Workshop

**Seasonal Weather Readiness for
Texas Generators**

June 8, 2011



Presentation Overview

- Introduction and Summary of Findings
- Call to Action
- Best Practices
- Recommended Guidelines



Introduction and Summary of Findings



Introduction

February 2011 Weather Event

- Coldest Texas weather since 1989.
- Single-digit and sub-freezing temperatures for more than 100 hours.
- Sustained winds of 30-40 mph with gusts of 50+ mph.
- New ERCOT winter peak demand record of 56,344 MW (with a second record set the following week).
- 225 units tripped, de-rated or failed to start (Feb. 1-3).
- 17.6% of total ERCOT winter 2011 capacity out at Feb. 2 peak.
- Except for nuclear facilities, all power plant types including coal/lignite, simple cycle gas, combined cycle gas and wind resources experienced problems.

Summary of Findings— TRE Report

- Wednesday, Feb. 2, 2011 was one of the coldest days in the last 25 years.
- During the Feb. 1 – 3 period, an extraordinary number of generating units tripped, de-rated or failed to start due mostly to freezing instruments and pipes, but some fuel availability issues occurred as well.
- High winds combined with the cold temperatures over an extended time period appears to have aggravated the freezing of instruments and piping.

Summary of Findings— TRE Report

- Approximately 17,519 MW was out of service prior to Feb. 2 due to scheduled outages (6640 MW), forced outages (5106 MW) and mothballing (5773 MW).
- ERCOT followed normal procedures but did experience some communication problems on Feb. 2.
- No indication that QSEs, TSPs and DSPs failed to act to prepare for an emergency.
- Conduct of ERCOT and market participants during the EEA was, for the most part, consistent with requirements in Protocols and Operating Guides, although.....

Summary of Findings— TRE Report

- Protocols and Operating Guides do not establish requirements for specific actions to prepare for extreme weather.
- **Key Finding of TRE Report:**
The February 2, 2011 EEA event was caused by either insufficient or ineffective preparation of generating facilities for prolonged freezing weather.



Call to Action



Call to Action

- Subsequent to the Feb. 2 event, PUC Chairman Smitherman called several generating company CEOs and asked them to review the event and make recommendations on how to prevent this from happening again.
- Five companies were asked to participate: Calpine, CPS Energy, LCRA, Luminant and NRG.
- A working team was established with meetings held in Austin and Houston in March and April.

Call to Action

- Team assessed event and the actions taken prior to and during the severe weather. Team developed:
 - White paper (on event and request)
 - Best practices
 - Recommended Severe Weather Preparation Guidelines
- These three documents were presented to ERCOT CEO Trip Doggett on May 3, 2011.



Best Practices



Best Practices: Corporate Level

- Executive involvement and support.
- Company-specific emergency operating plan that includes:
 - Policy
 - Documented, written procedures with a timeline for activities
 - Seasonal weather preparation meetings for winter and summer
 - Accountability / verification procedures
 - Internal and external communications plan
- Continuous improvement process to document lessons learned / best practices after each event.
- Freeze protection design criteria implemented consistently across the entire fleet.

Best Practices: Plant Level

- Plant-specific emergency operating plan that includes:
 - Checklists to ensure proper preparation for severe weather
 - Inspection of heat tracing circuits (especially on critical instrumentation) including wiring, insulation, control panels, etc.
 - Installation of secondary wind barriers to protect critical equipment and instrumentation.
 - Procedure for continuous monitoring of heat tracing on critical lines and pipes during severe weather events.
 - Process for ensuring adequate quantities of winter weather supplies in advance of season and an event.
 - Process for ensuring adequate staffing during an event.
- Work orders / requests automatically generate each year to ensure preparation activities are initiated and completed prior to season.

Best Practices: External

- Consider formalizing process for requesting discretionary enforcement regarding environmental permits in support of grid reliability. Develop an MOU with PUC, TCEQ and ERCOT.
- Consider warming / starting additional gas units prior to winter weather to improve unit readiness and reliability. Allow for longer start times.
- Share lessons learned with generators in ERCOT
 - Standing PDOC agenda item?
 - Other mechanisms?



Recommended Winter Weather Readiness Guidelines



Recommended Guidelines

- Purpose
 - To maintain individual unit reliability with freeze protection guidelines, lessons learned and best practices.
- Assumptions
 - Generation operators are responsible for maintaining the readiness and reliability of their units.
 - Generation operators should develop robust company and plant-specific guidelines based on geographical location, design, technology and plant configuration.

Recommended Guidelines

- **Safety**
 - Safety remains top priority and will not be compromised.
- **Management readiness and involvement**
 - Corporate management accountability.
 - Set expectations for safety, environmental compliance and generation
 - Ensure weather preparation policy and plan exist for fleet.
 - Ensure communications plan exist.
 - Executive involvement and signoff to verify readiness.
 - Plant management accountability.
 - Develop plant-specific procedures and checklists to direct and document preparation of plant and all critical instrumentation and equipment for severe weather.
 - Ensure all preparation measures are documented, completed, verified and provided to senior executives by a specified date.
 - Ensure adequate staffing, supplies and fuel prior to and during an event.

Recommended Guidelines

- **Communications**

- Before
 - Communicate readiness prior to event.
- During
 - Activate an Emergency Operating Center (EOC) or similar facility to coordinate all internal and external communications.
- After
 - Document lessons learned / best practices and review annually.