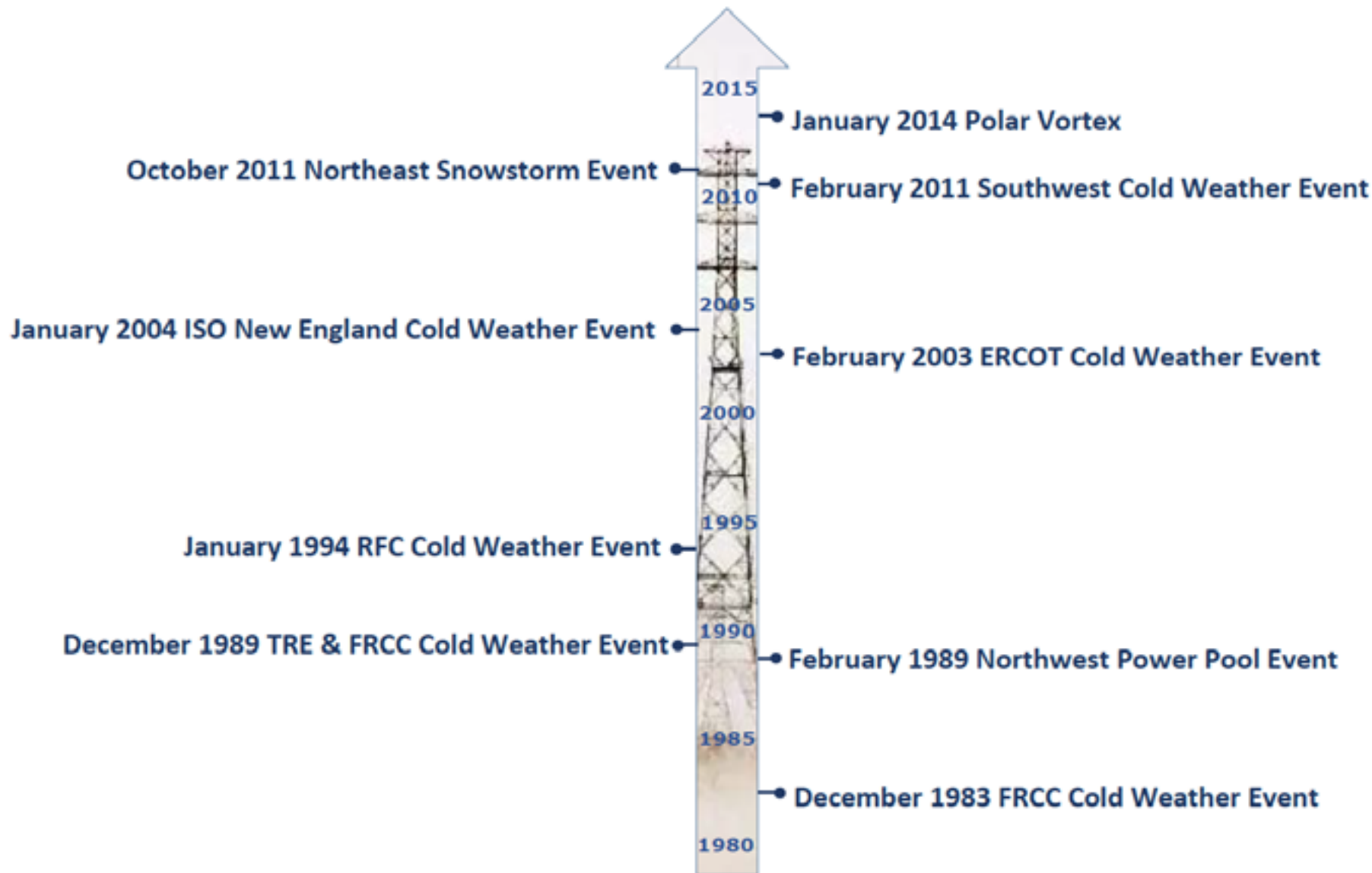


Home



Please click on the image above to navigate to an external site to view the video.

Events



Events
Analysis

Operational

Operational Challenges

Description	Lessons Learned
<ul style="list-style-type: none">• <i>Wind turbine nacelle-mounted oil coolers</i> can accumulate ice quickly in a snowstorm if the oil isn't circulating and creating heat to melt the winter precipitation.	Rotational Load Shed
<ul style="list-style-type: none">• Freezing temperatures and precipitation can cause ice to gradually accumulate on <i>generator turbine (GT) air ducts</i>.	Gas and Electricity Interdependency
<ul style="list-style-type: none">• <i>Substation transformers</i> can trip due to low oil levels.	Capacity Awareness during an Energy Emergency Event

Generation Challenges

Description	Lessons Learned
<ul style="list-style-type: none"> <i>Wind turbine nacelle-mounted oil coolers</i> can accumulate ice quickly in a snowstorm if the oil isn't circulating and creating heat to melt the winter precipitation. 	Wind farm winter storm issues
<ul style="list-style-type: none"> Freezing temperatures and precipitation can cause ice to gradually accumulate on <i>generator turbine (GT) air ducts</i>. 	Winter storm inlet air duct icing
<ul style="list-style-type: none"> <i>Generator plant design</i> can limit its tolerance for low temperatures. 	Generating Unit Temperature Design Parameters
<ul style="list-style-type: none"> <i>Units</i> can trip due to HP Bypass thermocouple failure; frozen HP Steam Pressure, and frozen LP Drum level transmitters. 	Adequate Maintenance and Inspection of Generator Freeze Protection
<ul style="list-style-type: none"> <i>Freezing equipment and infrequent use of alternative fuels</i> can render a gas powered plan unreliable. 	Plant Fuel Switching and Cold Weather
<ul style="list-style-type: none"> <i>Frozen instrument transmitters and instrument sensing lines</i> can cause a combined cycle gas turbine failure to start. 	Plant Instrument and Sensing Equipment due to Heat Trace and Insulation Failures
<ul style="list-style-type: none"> <i>Components freezing in 0 degree F conditions</i> can cause generation to go offline. 	Plant Onsite Material and Personnel Needed for a Winter Weather Event
<ul style="list-style-type: none"> <i>Frozen instrument sensing lines</i> can cause false instrumentation signals to be transmitted. 	Plant Operator Training to Prepare for a Winter Weather Event

Transmission Challenges

Description	Lessons Learned
<ul style="list-style-type: none">• <i>Substation transformers</i> can trip due to low oil levels.	Transformer oil level issues during cold weather
<ul style="list-style-type: none">• Water can collect and freeze in <i>transmission electrical disconnect equipment</i> and reduce current carrying capabilities.	Transmission Facilities and Winter Weather Operations

Click anywhere in the document below to view the complete framework for developing an effective winter weather readiness program.

The image shows a screenshot of a document titled "NERC Reliability Guideline: Generating Unit Winter Weather Readiness – Current Industry Practices". The document is framed by a blue border and features the NERC logo at the top left. The content includes a preamble, a purpose statement, assumptions, guideline details, and a section on safety. At the bottom, there is a blue bar with the text "RELIABILITY | ACCOUNTABILITY".

NERC
NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability Guideline

Generating Unit Winter Weather Readiness – Current Industry Practices

Preamble:
It is in the public interest for NERC to develop guidelines that are useful for maintaining or enhancing the reliability of the bulk power system (BPS). Reliability Guidelines provide suggested guidance on a particular topic for use by BPS users, owners, and operators according to each entity's circumstances. Reliability Guidelines are not to be used to provide binding norms, establish mandatory reliability standards, or create parameters by which compliance to standards is monitored or enforced.

Purpose:
This Reliability Guideline is applicable to electricity sector organizations responsible for the operation of the BPS. Although this guideline was developed as a result of an unusual cold weather event in an area not normally exposed to freezing temperatures, it provides a general framework for developing an effective winter weather readiness program for generating units throughout North America. The focus is on maintaining individual unit reliability and preventing future cold weather related events. This document is a collection of industry practices compiled by the NERC Operating Committee (OC). While the incorporation of these practices is strictly voluntary, developing a winter weather readiness program using these practices is highly encouraged to promote and achieve the highest levels of reliability for these high impact weather events.

Assumptions:

- A. Each BPS generation owner and operator is responsible and accountable for maintaining generating unit reliability.
- B. Entities should develop and apply plant-specific winter weather readiness plans, as appropriate, based on factors such as geographical location, technology and plant configuration.

Guideline Details:
An effective winter weather readiness program, which includes severe winter weather event preparedness, should generally address the following components: (i) Safety; (ii) Management Roles and Expectations; (iii) Processes and Procedures; (iv) Evaluation of Potential Problem Areas; (v) Testing; (vi) Training; and (vii) Communications. This program will be referred to hereafter as a winter weather preparation procedure.

1. Safety
Safety remains the top priority during winter weather events. Job safety briefings should be conducted during preparation for and in response to these events.

RELIABILITY | ACCOUNTABILITY

Capacity awareness during an emergency event... Page 3
December 1983 FRCC cold weather event... Page 2
December 1989 TRE & FRCC cold weather event... Page 2
February 1989 Northwest Power Pool event... Page 2
February 2003 ERCOT cold weather event... Page 2
February 2011 southwest cold weather event... Page 2
Gas and electricity interdependency... Page 3
Generator freeze protection... Page 4
Generating unit temperature design parameters... Page 4
Heat trace and insulation failures... Page 4
January 1994 RFC cold weather event... Page 2
January 2004 ISO New England cold weather event... Page 2

January 2014 Polar Vortex... Page 2
October 2011 Northeast Snowstorm event... Page 2
Plant Fuel switching and cold weather... Page 4
Plant onsite material and personnel... Page 4
Plant operator training... Page 4
Reliability Guideline... Page 6
Rotational load shed... Page 3
Transformer oil level issues during cold weather... Page 5
Transmission facilities and winter weather operations... Page 5
Wind farm storm issues... Page 4
Winter storm inlet air duct icing... Page 4