Title: **Riverton Extreme Cold Weather Plan**	**Revision: C 12/17/2024**	**Author:** Manager of Operations-Riverton
Approval Signature(s) and date: **Justin Moll**, Plant Director, Energy Center: Justin Moll (Dec 17, 2024 14:46 CST) **Brian Berkstresser**, Sr. Director of Generation Operations: Brian Berkstresser (Dec 18, 2024 07:27 CST) **Thierry Ngassa**, Manager of NERC Compliance: Thierry Ngassa (Dec 17, 2024 15:10 EST)		
Applicable NERC Standard(S): EOP-012		

Revision History

Revision	Date	Changes	Approved By
A	09/01/2024	New documented procedure for Cold Weather Plans	Moll, Berkstresser
B	09/26/2024	Changed document to include EOP-012 document requirements with , ie. R1.2.2	Moll, Berkstresser
C	12/17/2024	Changed the ECWP to the NERC Compliance format; Added "Manager, NERC Compliance" as an Approver; remove attachments from document and note location in shared drive	Moll, Berkstresser, Ngassa

1.0 **PURPOSE**: The purpose of this plan is to ensure that the Riverton Power Station can operate reliably and safely during extreme cold weather events by incorporating best industry practices for site personnel and equipment.

2.0 **SCOPE**: Riverton generation plant

3.0 **ASSOCIATED DOCUMENTS:**
Riverton Extreme Cold Weather Temperature (ECWT) Calculation Report,
Attachment A: (EOP-012-2, R1.2.2) Generating Unit Ratings,
Attachment B: (EOP 012-2, R3) Heat Trace Rating Based on Design Criteria,
Attachment C: PM list,
Attachment D: Generator Cold Weather Critical Component List,
Attachment E: (EOP-012-2, R6) Corrective Action Plan (CAP) Template.

All attachments located in the shared drive at :Riverton\NERC\EOP\EOP-012 Extreme Cold Weather Preparedness and Operations\Attachments for EOP-012

4.0 **SPECIAL INSTRUCTIONS:**
1. Training will be performed every October.

2. Preventive Maintenance tasks will be used to ensure Critical Components are inspected before each cold weather season and maintained during cold weather events

5.0 **PROCEDURE:**

The following processes will define how the Extreme Cold Weather Temperature is calculate and how the plant will reduce the risks associated with the Critical Components during extreme cold weather.

Extreme Cold Weather Temperature (R1.1):

5.1 NERC defines Extreme Cold Weather Temperature ("ECWT") as, "The temperature equal to the lowest 0.2 percentile of the hourly temperatures measured in December, January, and February from 1/1/2000 through the date the temperature is calculated."

5.2 To calculate the ECWT, hourly temperature records are sourced from the Global Historical Climatology Network-hourly (GHCNh), Version 1, maintained by the National Centers for Environmental Information ("NCEI") under the National Oceanic and Atmospheric Administration ("NOAA"). Data is collected from the nearest weather station to the generation site that reports FM-15 (METAR) data. If sub-hourly records are available, only one record per hour is used.

5.2.1 If a temperature record is missing for a specific hour, dating back to midnight on January 1, 2000, data from the next closest weather station with an available record for that hour is used. This process is repeated until all historical gaps are filled.

5.2.2 To ensure accuracy, only weather stations within 200 miles and ±500 feet of elevation from the generation site are considered.

5.2.3 Once a complete history of temperature records is established, the 0.2 percentile of recorded temperatures is calculated to determine the Extreme Cold Weather Temperature (ECWT) of the site.

5.2.4 If new corrective actions are needed to provide the required operational capability under Sections 7 and 8 of this Cold Weather Plan, Riverton will develop a Corrective Action Plan as defined in Section 11 of this Plan within 6 months of the recalculation.

Generating Units Cold Weather Data (R1.2)

6.0 The following data is used to determine the generating units operating limitations in cold weather

6.0.1 (R1.2.1.1) Capacity and Availability:
All turbines on site are rated to operate below ECWT calculation.

6.0.2 (R1.2.1.2) Fuel Supply and inventory concerns:
Liberty-Empire has sufficient firm natural gas transport capacity on Southern Star Central Pipeline to maintain reliable operation. However, the risks associated with extreme cold weather events and natural gas supply to the generation unit's reliability include, but are not limited to, availability of deliverable local supply and pipeline transport reliability. Examples of these risk include natural gas marketers not having supply for sale, available volumes are not deliverable, freeze offs at production plants, pipeline transportation cuts, reduced pipeline pressure and mechanical failures experienced on pipeline equipment.

6.0.3 (R1.2.1.3) Start-up Issues:
None noted as all units are rated below ECWT calculation.

6.0.4 (R1.2.1.4) Fuel switching capabilities:
a) Units 10 and 11 are capable of operating on natural gas or #2 Diesel.
b) Unit 12 only operates on natural gas.

6.0.5 (R1.2.1.5) Environmental Restraints:
No extreme cold weather environmental constraints.

6.1 (R1.2.2) Generating unit(s) minimum:
Documentation for each generating unit rating in Attachment A.

Extreme Cold Weather Plan for Future Generation (R2)

7.0 If new generation capabilities are added to the site, Riverton will implement freeze protection measures to protect Generator Cold Weather Critical Components that provide the capability to operate at the unit(s)' Extreme Cold Weather Temperature with sustained concurrent twenty (20) mph wind speed for (i) a period of not less than twelve (12) continuous hours, or (ii) the maximum operational duration for intermittent energy resources if less than twelve (12) continuous hours

7.1 If any of the freeze protections detailed in Section 7.0 above cannot be performed, a Corrective Action Plan as defined in Section 11 below will be created to provide the capability to operate at the unit(s)' Extreme Cold Weather Temperature with a sustained concurrent twenty (20) mph wind speed for (i) a period of not less than twelve (12) continuous hours, or (ii) the maximum operational duration for intermittent energy resources if less than twelve (12) continuous hours.

Extreme Cold Weather Plan for Existing Generation (R3)

8.0 Riverton will use Heat Trace Rating (Attachment B) as evidence that it has freeze protection measures to withstand the ECWT for that unit.

8.1 If a Critical Component is identified as being unable to operate at the ECWT, Riverton will develop a Corrective Action Plan (See Section 11 of this document) as needed to add new or modify existing freeze protection measures to provide the capability to operate at the ECWT.

Cold Weather Preparedness Plan (R4)

9.0 The Riverton Preventative Maintenance work orders ("PMs"), which are housed in the company's maintenance management system ("SAP"), form the basis of what is the Riverton Cold Weather Plan. These PMs (Attachment C), along with dedicated training, are performed annually to prepare for the upcoming winter season. The PMs will address all of the following:

9.0.1 (R4.1) All generating units are in the same location. The Extreme Cold Weather Temperature for all Riverton units is found in the "Riverton Extreme Cold Weather Temperature (ECWT) Calculation Report".

9.0.2 (R4.2) The hourly data used to calculate the ECWT can be found in the "Riverton Extreme Cold Weather Temperature (ECWT) Calculation Report".

9.0.3 (R4.3) The Critical Components are listed in Attachment D.

9.0.4 (R4.4) Most of the critical components at the Riverton Power Station are enclosed in heated structures (ex. doghouses on south end of HP, IP, and LP drums). Others are placed in remote heated enclosures (O'Brien boxes) to withstand extreme cold.

9.0.5 (R4.5) Riverton uses the annual PMs listed in Attachment C to ensure the annual inspection and maintenance of all of the freeze protection measures.

9.1 The winter PMs are produced each year in the September and October timeframe and are to be completed by October 31 of each year. As a caveat, some of the heat trace controls require ambient temperature to drop below 50 degrees F to be tested. In an unseasonably warm fall, this may prevent testing of all systems before the October 31 deadline. All efforts will be made to avoid this occurrence.

Training (R5)

10.0 Cold Weather training will be given by site management. Cold weather training is required annually for all applicable plant personnel. Training will be completed by the end of October each year. Training will be documented and available for inspection as well as attendance logs, when requested.

10.1 Applicable plant personnel required for annual training are as follows: Plant Director, Operations Manager, Maintenance Manager, Results Manager, Project Manager/Plant Engineer(s), Operator/Technician(s) and Apprentice.

Corrective Action Plans (R6 and R7)

11.0 A Corrective Action Plan will be created using the form in Attachment E for every Generator Cold Weather Reliability Event or pursuant to Sections 5.2.4, 7.1, or 8.1 of this Extreme Cold Weather Plan. The folder containing any Corrective Action Plans is located in the shared drive at: Riverton\NERC\EOP\EOP-012 Extreme Cold Weather Preparedness and Operations\Riverton Corrective Action Plans for EOP-012

11.1 A Cold Weather Reliability Event is defined by NERC as, "One of the following events for which the apparent cause(s) is due to freezing of equipment or impacts of freezing precipitation (e.g., sleet, snow, ice, and freezing rain) on equipment within the Generator Owner's control, and the dry bulb temperature at the time of the event was at or above the Extreme Cold Weather Temperature:
(1) a forced derate of more than 10% of the total capacity of the unit, but not less than 20 MWs for longer than four hours in duration;
(2) a start-up failure where the unit fails to synchronize within a specified start-up time; or
(3) a Forced Outage."

11.2 The Corrective Action Plan shall be developed within 150 days or by July 1, whichever is earlier, and contain at a minimum all of the following:
(1) (R6.1) A summary of the identified cause(s) for the Generator Cold Weather Reliability Event, where applicable, and any relevant associated data.
(2) (R6.2) A review of applicability to similar equipment at generating units at the Riverton generation plant.
(3) (R6.3) An identification of operating limitations or impacts to the cold weather preparedness plan that would apply until execution of the corrective action(s) identified in this Plan.

11.3 (R7) The Corrective Action Plan will contain all subsections of 10.3 of this Plan.

11.3.1 (R7.1) A timetable for implementing the selected corrective action(s) that includes all of the following:
(1) (R7.1.1) List the action(s) which address(es) existing equipment or freeze protection measures, if any, to be completed within 24 calendar months of completing development of the Corrective Action Plan;
(2) (R7.1.2) List the action(s) which require(s) new equipment or freeze protection measures, if any, to be completed within 48 calendar months of completing development of the Corrective Action Plan.
(3) (R7.1.3) List the updates needed to the controls identified in Section 4 of this Plan to identify the updates or additions to the Generator Cold Weather Critical Components and their freeze protection measures.

11.3.2 (R7.2) Implement the Corrective Action Plan in accordance with the specified timetables created by Section 10.3.1

11.3.3 (R7.3) Update the Corrective Action Plan action(s) and timetable(s), with justification, if corrective action(s) change or timetable(s) exceed the timelines in Section 10.3.1.

11.3.4 (R7.4) Document in a declaration, with justification, any Generator Cold Weather Constraint that precludes Riverton from implementing selected action(s) contained within the Corrective Action Plan.

Generator Cold Weather Constraint Declaration (R8)

12.0 (R8.1) All Generator Cold Weather Constraint declarations created pursuant to Section 10.3.4 of this Plan will be reviewed every 5 years, or as needed when a change in status occurs. (R8.2) The operating limitations identified in Attachment A that are associated with capability and availability must also be updated. Declarations are located on a spreadsheet in the shared drive at: Riverton\NERC\EOP\EOP-012 Extreme Cold Weather Preparedness and Operations\Attachments for EOP-012\ Generator Cold Weather Constraint Declaration Spreadsheet (R8)