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# RF WINTERIZATION PROGRAM AND STANDARDS UPDATE

**Ash Chappell**

July 17, 2023, Technical Talk with RF

RELIABILITY FIRST

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# AGENDA

**STANDARDS UPDATE:**

- EOP-011-3/4
- EOP-012-1/2
- IRO-010-4 & TOP-003-5
- COMO Winterization Walkdowns

**WINTERIZATION PROGRAM:**

- Difference between COMO walkdowns and winterization program
- Entity benefits
- Survey criteria and timing

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# EOP-011-2 RECAP FOR GO/GOP

- Effective 4/1/2023
- R7 and R8
- Generators will create freeze protection measures based on geographical location/plant configuration
- Inspection and maintenance
- Cold weather data to include certain criteria
- Training

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# EOP-011-3/4

- EOP-011-3 is approved but FERC has deferred approving the effective date until EOP-012-1 is revised
- EOP-011-3 moved GO/GOP requirements to EOP-012-1
- EOP-011-4 added applicability for Distribution Providers
- Provision for identification and prioritization of designated critical natural gas infrastructure loads incorporated into their plan

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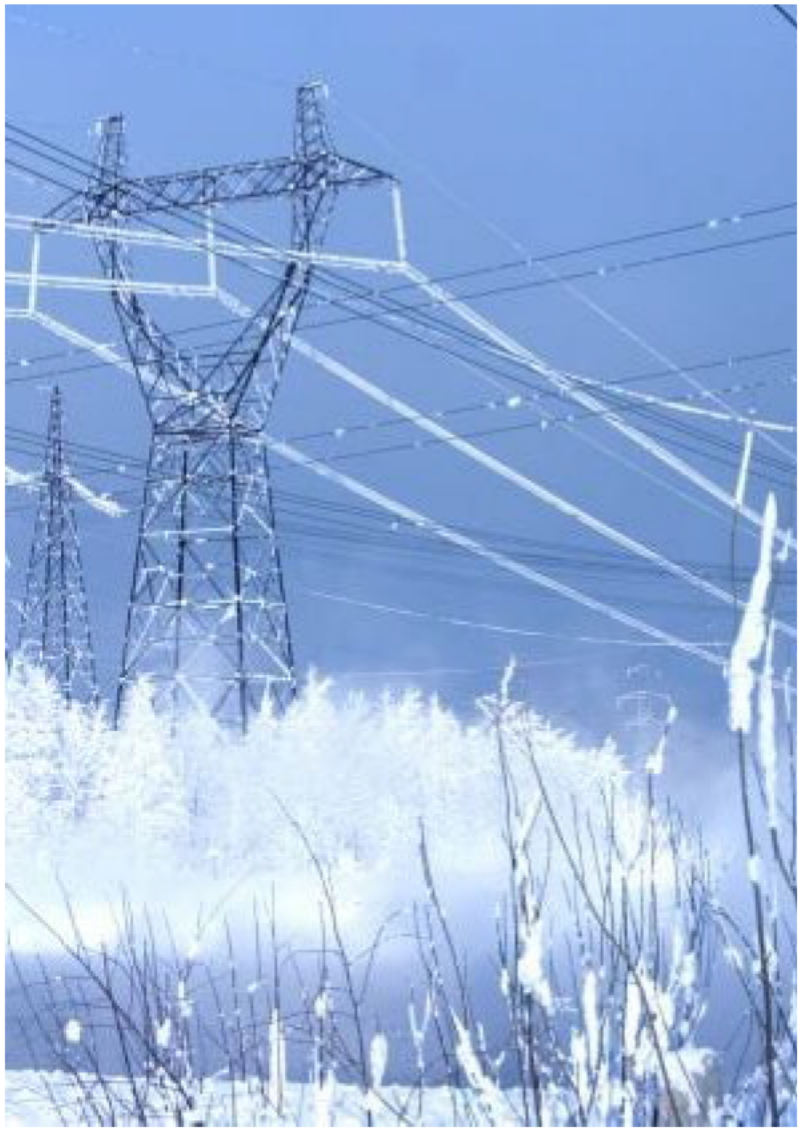
# EOP-012 PURPOSE - GO/GOP

- Calculate the Extreme Cold Weather Temperature of its applicable generating unit(s)
- Have freeze protection measures to support the entity identified values
- Develop and implement a corrective action plan in the event the generator is not capable of operating at its declared operating temperature
- Implement and maintain a cold weather plan
- Training
- How to address Generator Cold Weather Constraint Declaration



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# EOP-012-1

- EOP-012-1 has an effective date of 10/1/2024
- Applicable to GO/GOP
- Project 2021-07 is currently revising EOP-012-1, and currently in ballot from 7/11/2023 – 7/20/2023

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# IRO-010-4 & TOP-003-5 – PURPOSE

ALSO EFFECTIVE 4/1/2023

- IRO-010-4 R1 The Reliability Coordinator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments. The data specification shall include but not be limited to:
- TOP-003-5 R1 Each Transmission Operator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments. The data specification shall include, but not be limited to:
- TOP-003-5 R2 Each Balancing Authority shall maintain a documented specification for the data necessary for it to perform its analysis functions and Real-time monitoring. The data specification shall include, but not be limited to:

SAME language as EOP-011-2 R7!!!

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# COMO WINTERIZATION WALKDOWNS

- YES, RF in Fall 2023 will be performing COMO winterization walkdowns to support EOP-011-2
- Benefits to walkdowns: Similar to FAC-003 & FAC-008, RF wants to see your program in-person, complementing your process documentation
- What to expect:
  - RF will review entity's winterization plan and ask questions as needed
  - RF will be asking for a tour of the station, and have the SME, along with responsible compliance personnel to explain how the entity satisfies the winterization plan
  - RF will interview individuals who have received training
  - RF will provide feedback on the entity's plan

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# ASSIST VISIT VS. COMO VISIT

## What is the Entity Engagement Winterzation Assist Visit program and how is it different than COMO Winterzation Visit program?

I would like to turn it over to Joe Jagodnik, to describe the Entity Engagement Winterization Assist Visit program and how they are different from the COMO Winterization visit program.

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# RELIABILITYFIRST ENTITY ENGAGEMENT DEPT. COLD WEATHER WINTERIZATION

**Joseph Jagodnik, Senior Reliability Consultant**

July 17, 2023 – Technical Talk with RF

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# AGENDA

- Promote RF Entity Engagement Assist Visit program for Cold Weather Winterization
- Contrast Entity Engagement Assist Visit to Compliance Monitoring and Enforcement environments
- Explore foreseeable cold weather impacts to BES generators and related equipment and facilities with commonly accepted mitigation efforts
- Contribute added testimony from recent registered entity generator owner that successfully completed CWW consultation

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# MERITS OF CWW ASSIST VISITS

- Complementary ERO service to registered entities
- Availability of full RF (ERO) resources and departments
- Options of conducting remote or onsite appointments
- Demonstrates proactive engagement by registered entity

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# WINTER READINESS PROGRAM

**Goal: to assess preparations and planning for the upcoming winter and raise awareness**

- Focus on new generating facilities, those that experienced cold weather-related issues
- RF performs various outreach activities to educate and inform all GOs, GOPs

**This Program is *NOT*:**

- Part of any compliance monitoring process
- A formal certification that a plant is adequately prepared for winter operations

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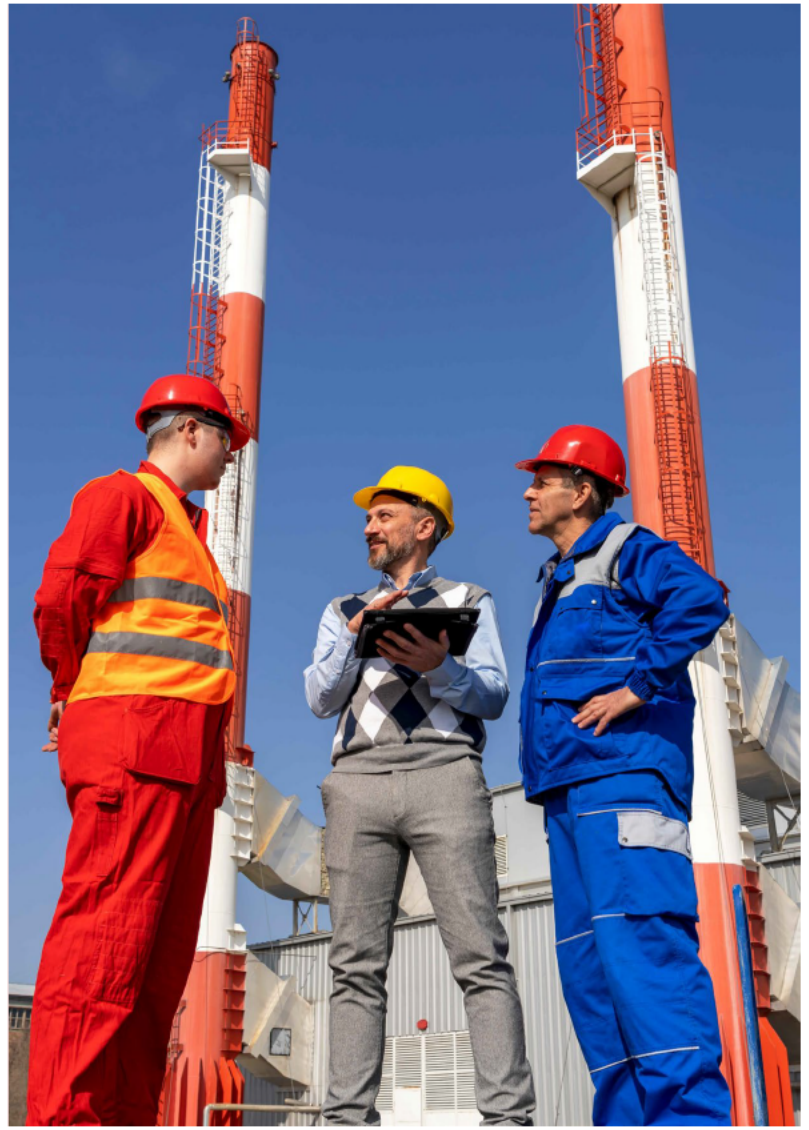
# ASSIST VISIT ENVIRONMENT

- Beyond strict compliance, focuses on:
  - Keeping plant online in winter
  - Whole program analysis
- Potentially dives deeper than Compliance Monitoring into:
  - Processes
  - Procedures
  - Methods of accomplishment
- Explores different methods or alternatives
- Includes different sets of eyes examining issues
- Converts noncompliances into self-reports



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# RF WINTER READINESS SURVEY

- Newly commissioned plants in 2023
- Existing generation that experienced a cold weather outage
- Survey sent out late summer/early fall

| 1.0 | PLANT WINTERIZATION - OVERALL CONCERNS & ISSUES |
|---|---|
| 1.1 | How many boiler-turbine-generator enclosures are of the outdoor type, i.e., boiler room and turbine-generator room are not enclosed and directly exposed to weather conditions? |
| 1.2 | How many boiler-turbine-generator enclosures are of the semi-outdoor type, i.e., boiler room partially enclosed with portions directly exposed to weather conditions but turbine generator room fully enclosed? |
| 1.3 | How many boiler-turbine-generator enclosures are of the indoor type, i.e., boiler room and turbine-generator room are fully enclosed and not directly exposed to weather conditions? |
| 1.4 | Due to the applicable type of configuation, describe any past problems (trips, derates, fail-to-start, etc.) caused by extreme weather and list the amount of megawatts impacted. |
| 1.5 | Does your entity presently have a plant winterization plan for all generating facilities? |
| 1.6 | Briefly describe the training program or exercise which prepares plant personnel for extreme cold weather conditions. |
| 1.7 | What plant personnel are specifically assigned or responsible for the plant winterization plan related to directing key activities before, during and after severe winter weather events? |
| 1.8 | To what level of corporate management is the plant winterization plan communicated? |
| 1.9 | What is the status of the your plant winterization plan? |
| 1.11 | What is your facility(ies) minimum starting temperature(s)? |
| 1.12 | What is your facility(ies) minimum design/operating temperature(s) and how long can the facility operate at that temperature? |

**Completion of this survey, as well as participation in RF cold weather program, is completely voluntary**

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# RF WINTER READINESS SITE VISITS

- New generating stations
  - Site visits will be requested of generating stations that have a capacity greater than 100 MW
- Existing generating stations
  - Site visits will be requested based upon recent cold weather outage/derate, historical performance, survey and follow up RFI responses
- Process
  - Timeline: Late October – Mid December
  - Duration: 1 day visit
  - Personnel: 2~4 RF staff members

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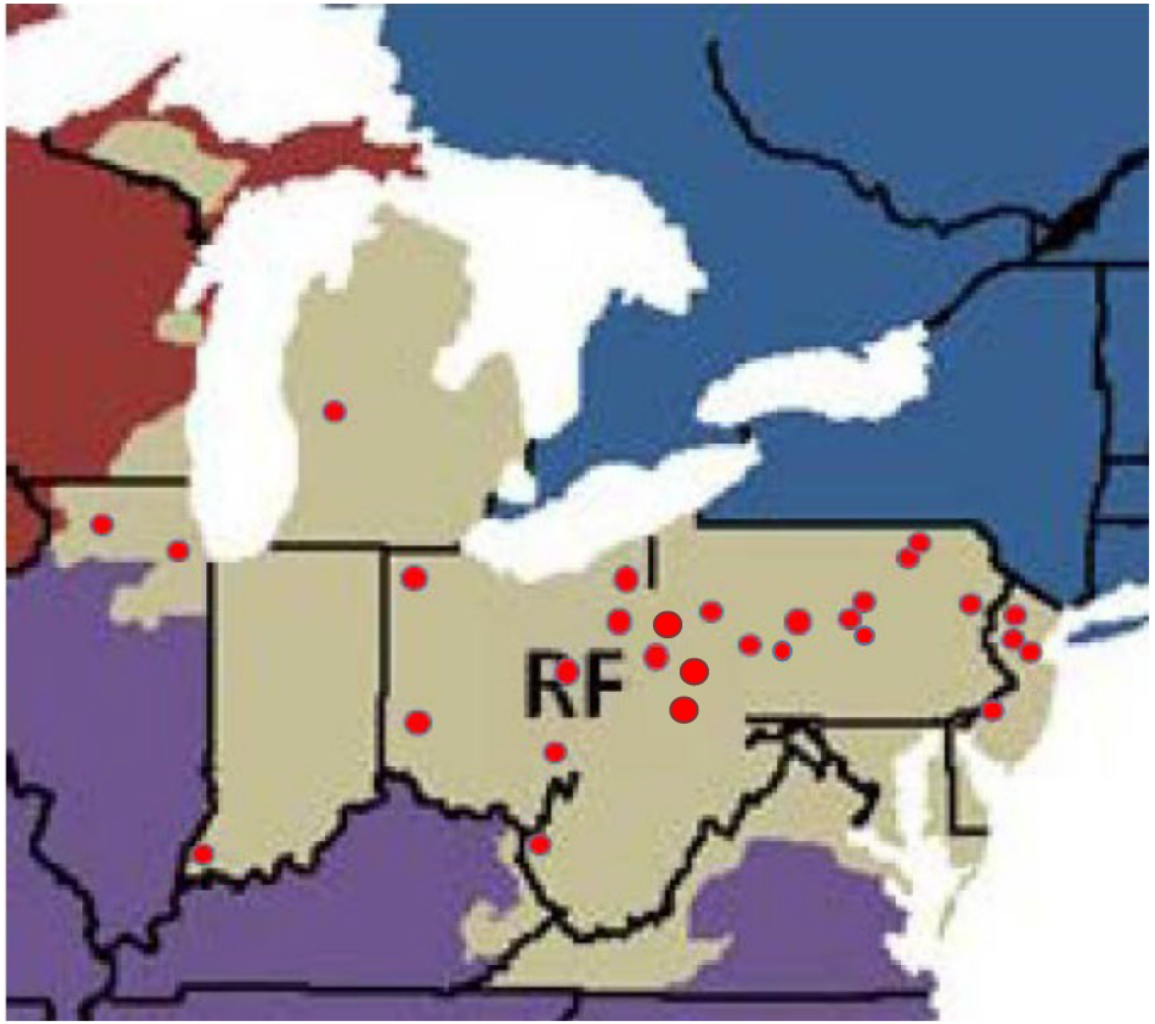
# HISTORICALLY SPEAKING…



## Plant Visit Locations




2014-2015: 9 surveys, 3 visits

2015-2016: 28 surveys, 7 visits

2016-2017: 8 surveys, 6 visits

2017-2018: 7 surveys, 4 visits

2018-2019: 26 surveys, 7 visits

2019-2020: 21 surveys, 2 visits

2020-2021: 0 surveys, 0 visits

2021-2022: 39 surveys, 2 visits

2022-2023: 25 surveys, 10 visits

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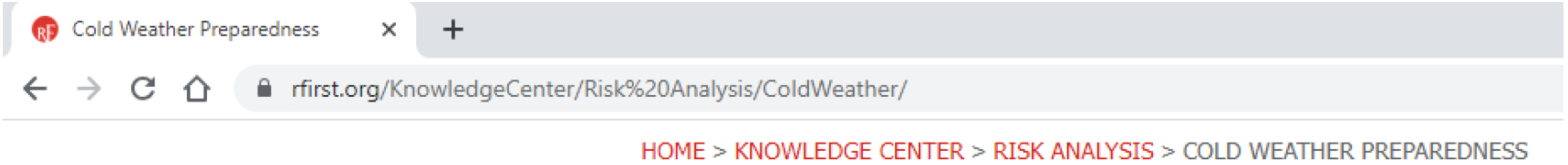
# RF COLD WEATHER KNOWLEDGE CENTER




## COLD WEATHER PREPAREDNESS

Cold weather preparedness and operations is key to ensuring reliability and resiliency of the Bulk Power System, especially given the cold weather the ReliabilityFirst footprint experiences year after year. Since 2014, ReliabilityFirst has strived to support generating facilities by identifying best practices as well as sharing lessons learned around cold weather preparedness.

The following documents are meant to serve as a reference of various cold weather preparedness materials. These documents include:

- Cold weather training materials from sources across the ERO
- ERO guidance and recommendations around cold weather preparedness
- Lessons Learned from cold weather events
- Reports from historical cold weather events

Specific to ReliabilityFirst's cold weather preparedness program, references include the surveys used to benchmark generating facilities' current cold weather preparedness as well as the best practices and lessons learned that have been identified over the years.

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# CWW Best Practices
# 1A. Use Instrument Enclosures

obcorp.com/product/instrument-enclosures-protection/

O'BRIEN / AMETEK


Data

INTERTEC

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# CWW Best Practices
# 1B. Use Instrument Enclosures

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# CWW Best Practices
# 2. Then Insulate Enclosures

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# CWW Best Practices
# 3. And Heat Trace Electric Cabling, Tubing


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# CWW Best Practices
# 4. Maintain and Test Equipment

- Keeping enclosure drain lines short to reduce freezing
- Scheduling heat tracing operational checks
- Completing freeze protection maintenance *before* winter
- Increasing operator and staff equipment inspection
- Dedicating *freeze protection operator* during winter months
- Continuously monitoring heat trace systems
  (use indicating display panels and lights)
- Integrating remote digital interface heat-tracing panels

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# CWW Best Practices
# 5A. Enclosure Heat-Trace Software Interfaces



Raychem Supervisor

File System Client Device Alarm Security Tools Reports View Language Help

Add Device | Configure | Monitor | Drawings | Copy Config

View by Device

- EHT System
  - (More Devices)
  - 11-HTT-CPL-01
  - 11-HTT-CPL-02
  - 11-HTT-CPL-03
  - 12-HTT-CPL-01
  - 12-HTT-CPL-02
  - 12-HTT-CPL-03
  - 1Z-HTT-CPL-01
  - 1Z-HTT-CPL-02
  - 1Z-HTT-CPL-03
  - 1Z-HTT-CPL-04
  - 1Z-HTT-CPL-05
  - 1Z-HTT-CPL-06
  - 1Z-HTT-CPL-07
  - 1Z-HTT-CPL-08

VIEW DEVICE | VIEW ALARMS | VIEW NOTES

| Device Tag | Device Type | Port | Address | Firmware Version | Children | Installed DateTime | Setpoint |
|---|---|---|---|---|---|---|---|
| \12-HTT-CPL-02\12-HTT-788 | CIRCUIT | | 1 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\HTT-JBX-487 | CIRCUIT | | 2 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\12-HTT-JBX-561,555,559,INS-ENC-117 | CIRCUIT | | 3 | | 0 | 12/3/2021 1:47 PM | 50°F |
| \12-HTT-CPL-02\SPARE | CIRCUIT | | 4 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\12-INS-ENC113 | CIRCUIT | | 3 | | 0 | 12/3/2021 1:47 PM | 50°F |
| \12-HTT-CPL-02\HTT-JBX-373,430,431 | CIRCUIT | | 6 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\HTT-JBX-711 | CIRCUIT | | 7 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\HTT-JBX-398,393,399 | CIRCUIT | | 8 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\HTT-JBX-458,466,387,386,554 | CIRCUIT | | 9 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\INS-ENC-218,221,12HTT-537,837,866 | CIRCUIT | | 10 | | 0 | 12/3/2021 1:47 PM | 50°F |
| \12-HTT-CPL-02\HTT-JBX-429,439 | CIRCUIT | | 11 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\INS-ENC-129,12JBX-301 | CIRCUIT | | 12 | | 0 | 12/3/2021 1:47 PM | 50°F |
| \12-HTT-CPL-02\SPARE | CIRCUIT | | 13 | | 0 | 12/3/2021 1:47 PM | 40°F |
| \12-HTT-CPL-02\12ENC 220 124 12JBX 863 858 510 805 | CIRCUIT | | 14 | | 0 | 12/3/2021 1:47 PM | 40°F |

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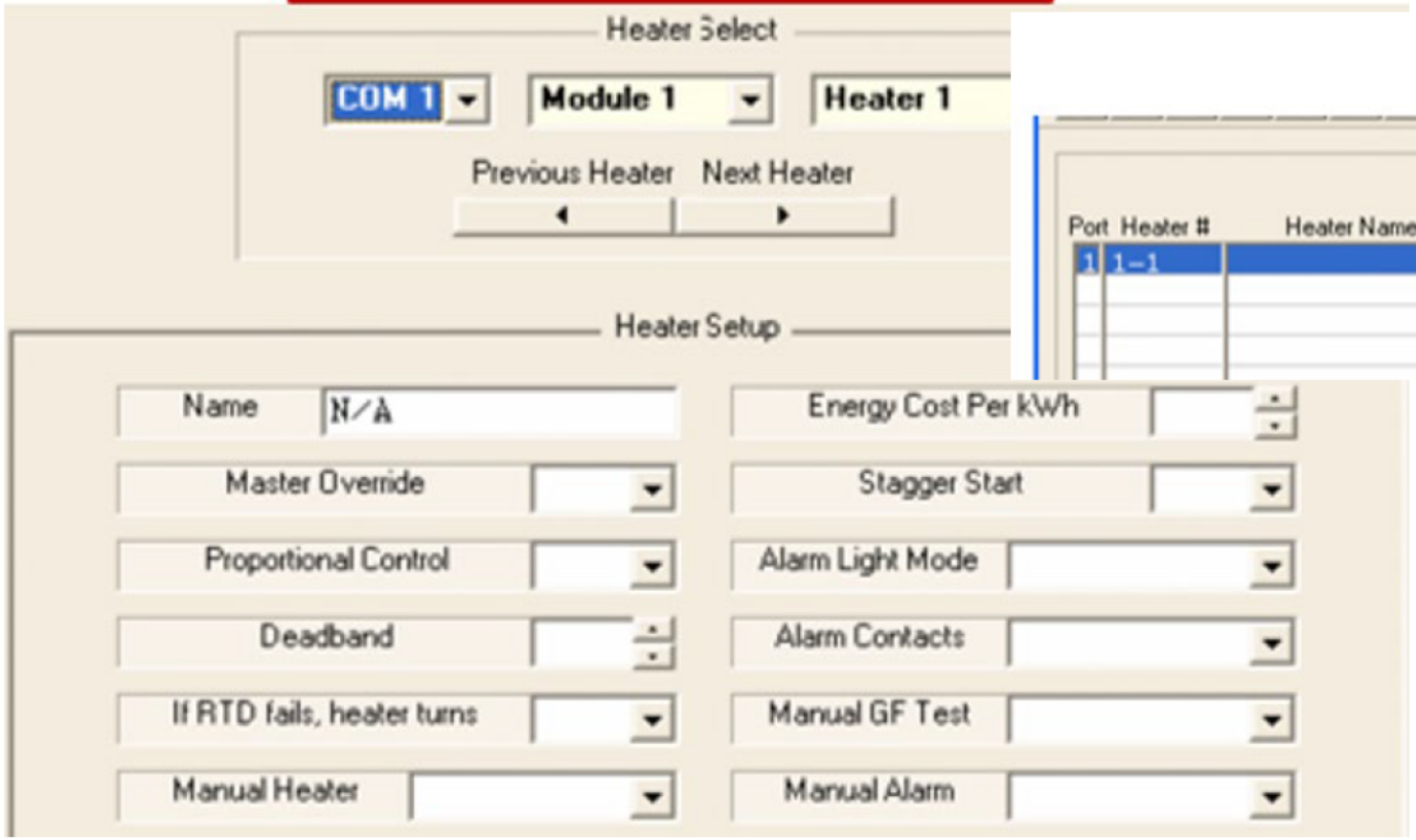
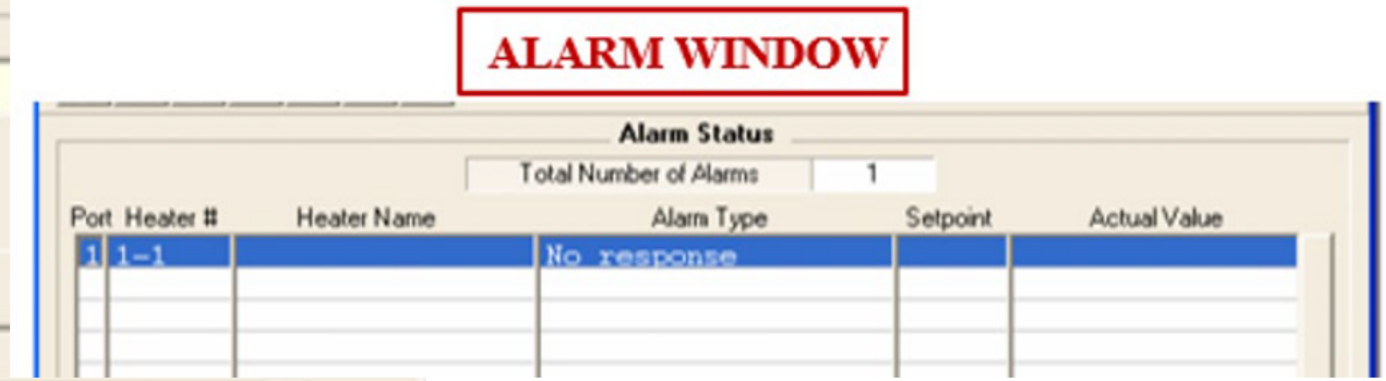
# CWW Best Practices
# 5B. Enclosure Heat-Trace Software Interfaces

**HEATER SETUP WINDOW**




**ALARM WINDOW**



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# Transmitter CW Failure Modes

- Heat-trace circuit breaker tripping
- Heat-trace panel blowing fuses
- After testing, contractor incorrectly terminating connection
- Insulating mechanical contractor damaging heat-trace
- Isolated heat-trace sections not functioning
- Heat-trace incorrectly applied to equipment
- Heat-trace circuit open-ended and ungrounded electrically
- Transmitter cabinet heater not functioning
- Absence of wind break considerations
- Transmitter exposed to elements, gaps in insulation

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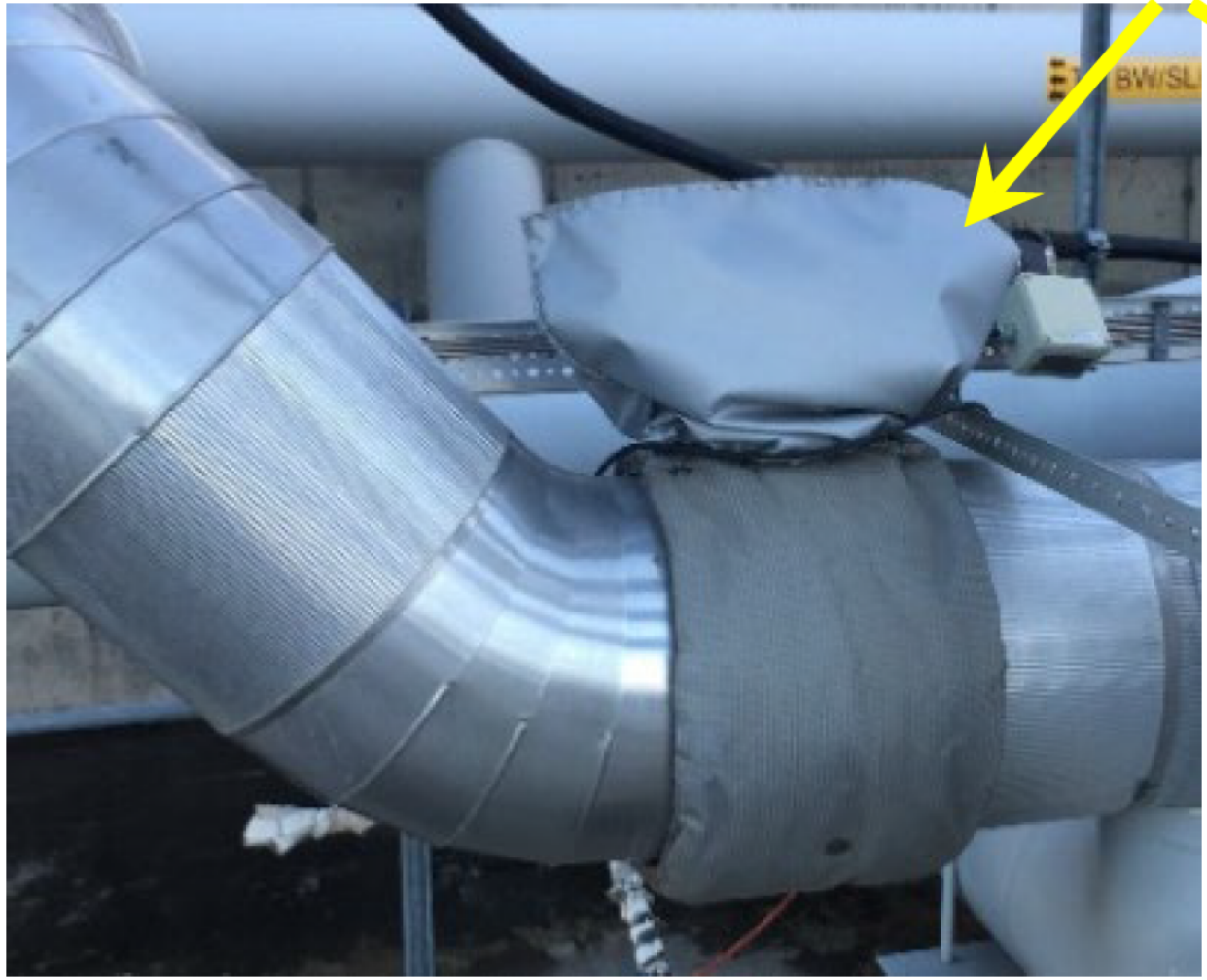
# CWW Best Practices
# 6. Insulate Critical Valves



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# CWW Best Practices
# 7. Pre-stage Critical Tools

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# CWW Best Practices
# 8A. Practical and functional windbreaks

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# CWW Best Practices
# 8B. Practical and functional windbreaks

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# CWW Best Practices
# 8C. Practical and functional windbreaks

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# CWW Best Practices
# 8D. Practical and functional windbreaks


**Image from inside windbreak shelter**

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# CWW Best Practices
# 8E. Practical and functional windbreaks


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# CWW Best Practices
# 8F. Practical and functional windbreaks

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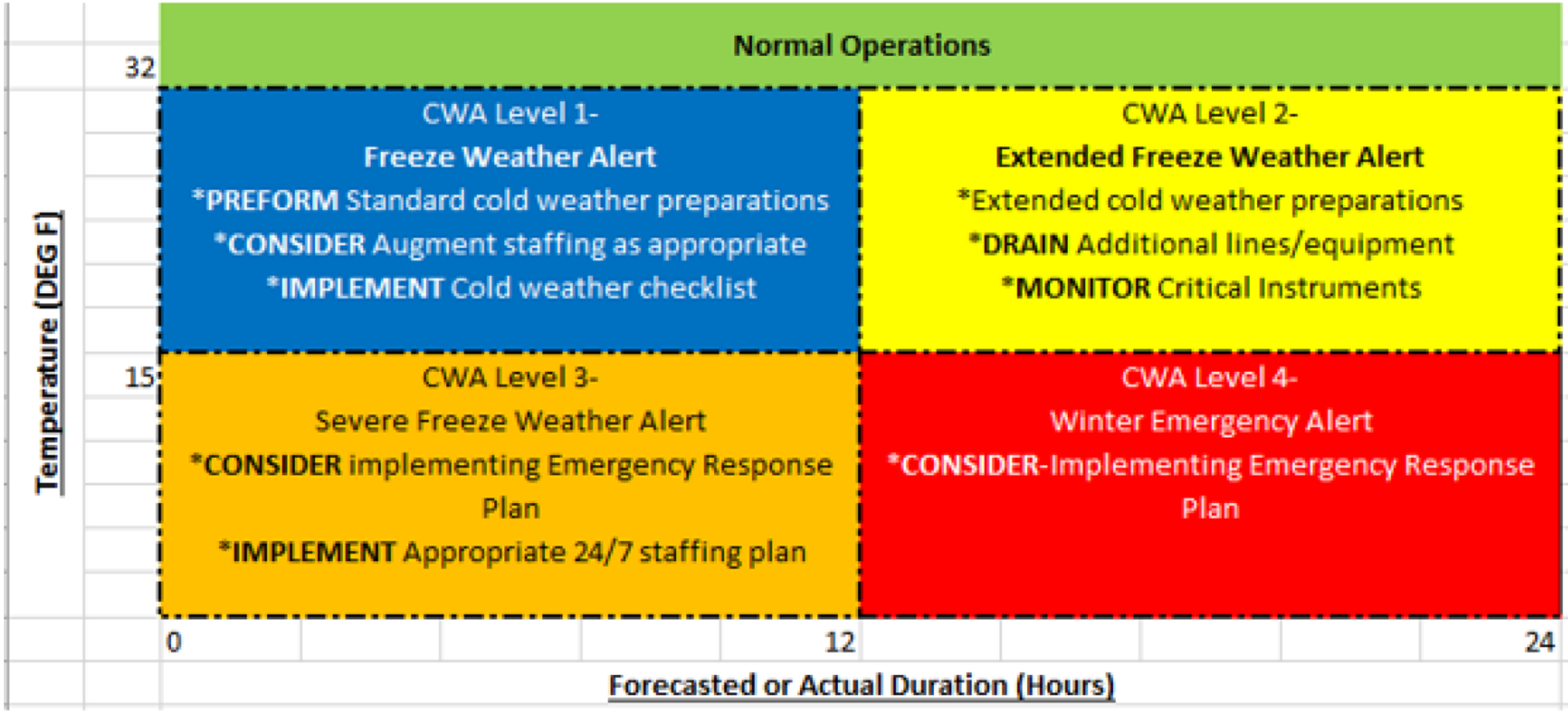
# RF WINTER READINESS RECOMMENDATIONS



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# RF WINTER READINESS RECOMMENDATIONS

- ✓Allow ample time to correct deficiencies - so begin winter readiness preparations in late summer/early fall
- ✓Implement lessons learned into winter readiness program
- ✓Complete training of operations and maintenance staff
- ✓Consider MISO or PJM winter guidelines as required
- ✓Communicate with MISO or PJM to ensure cold weather-related operating limitations
- ✓Provide all cold weather-related data to MISO or PJM prior to a cold weather event
- ✓Use winterization checklists, walk-downs, and ***RF AV report***

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# RF COLD WEATHER VISIT TESTIMONIAL FROM TALEN ENERGY

Nicholas Poluch

Talen Energy, Senior Manager, NERC

Colleen Dolan-VanZandt

Talen Energy, Manager, NERC Internal Controls

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# RF Site Visit for Weather Prep

RF's November 2022 Lower Mount Bethel Plant Review

# Agenda

- Results from the RF's November 2022 Weatherization Plant Review
- Applying RF recommendations – blending operations with compliance
- Importance of Workorder System to Talen
- Plant Manger's comments…How did the assist visit help the plant

# Lower Mount Bethel Plant

Plant Specifications

- Location: NE PA/ PJM
- Commercial Operating Year: 2004
- Primary Fuel:  Natural Gas
- Generating Capacity: 600 MW
- Employees:27

Weatherization Concerns:

- Plant is not enclosed
- Exposure to Elements

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# Results from RF Weather Prep Plant Review

**Consolidate** – Procedures, Checklist and Evidence should be included in one plan

**Include** - time period when checklist will be used, roles responsibilities

**Determine** - Critical Components that should be in plan

**Add** - Time Frames on when heat trace and other components will be reviewed for winter prep

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# Developing Cold Weather Plan Controls

| Control Environment | Control Activities | Monitoring Activities | Risk Assessment |
|---|---|---|---|
| ? | ? | ? | ? |
| ? | ? | ? | ? |
| ? | ? | ? | ? |
| ? | ? | ? | ? |
| ? | ? | ? | ? |
| ? | ? | ? | ? |
| ? | ? | ? | ? |

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# Blending Operations with Compliance Implementing Internal Controls

| Control Environment | Control Activities | Monitoring Activities | Risk Assessment |
|---|---|---|---|
| (Consolidate)**Evidence Repository** | (Consolidate) **One Plant Level Procedure and Compliance Evidence Form** | (Include) **Plant Work Orders** (time periods for checklists and responsibilities) | Cold Weather Preparedness – Annual Review |
| (Include) **Task Reminders** | (Determine) **Plant Critical Equipment List** | (Add) **Plant routine checklists** | Corporate NERC Group review of plant's Annual EOP-011-2 Compliance Evidence Form |
| NERC Group filing of evidence | Plant meetings | (Add) **Pre-weather event checklists** | NERC Cold Weather Real-Time Limitations Form |
| (Add Time Frame) **Annual Training** | Plant specific training (tail boards) | Corrective Work Orders | Corrective Action Plans |
| Escalation Group Management monitors tasks | (Include) **Tasks assigned to Plant NERC Contact** | Annual completion of EOP-011-2 Compliance Evidence Form | Create RSAW |
| Compliance Calendar | Regional NERC Contact review of evidence | NERC Cold Weather Real-Time Limitations Form | Weatherization Regulatory Risk Analysis Dashboard |

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# Work Orders Tracked Evidence Form Completed for 2022/23 Season

| Measure Category (R7.1) | Measure Description (R7.1) | Work Order (R7.2) | Completed Work Order (R7.2) |
|---|---|---|---|
| Work Orders | | | |
| Heat Tracing Circuit Checks | HEAT TRACE PANELS ANNUAL PM PDC2-EHTP-W | LMB - 46202158 | 46309636 |
| | HEAT TRACE PANELS ANNUAL PM PIPERACK-EHTP | LMB - 46202159 | 46309632 |
| | HEAT TRACE PANELS ANNUAL PM PDC3-EHTP-X | LMB - 46202161 | 46309635 |
| | HEAT TRACE PANELS ANNUAL PM PUMPROOM | LMB - 46202162 | 46309637 |
| | HEAT TRACE PANELS ANNUAL PM PDC4EHTP-Z | LMB - 46202163 | 46309633 |
| Building Heaters | BUILDING UNIT HEATER ANNUAL PM -ADMIN BLDG | LMB - 46201375 | 46314428 |
| | BUILDING UNIT HEATER ANNUAL PM -BFP BLDG UNIT 1 | LMB - 46201379 | 46314410 |
| | BUILDING UNIT HEATER ANNUAL PM -BFP BLDG UNIT 2 | LMB - 46201380 | 46309629 |
| | BUILDING UNIT HEATER ANNUAL PM -CHEM BLDG.pdf | LMB - 46201381 | 46314411 |
| | BUILDING UNIT HEATER ANNUAL PM -CLG TWR FIRE PROT VLV BLDG | LMB - 46201382 | 46314419 |
| | BUILDING UNIT HEATER ANNUAL PM -CT1 MECH PACKAGE | LMB - 46201383 | 46314423 |
| | BUILDING UNIT HEATER ANNUAL PM -CT2 MECH PACKAGE | LMB - 46201384 | 46314420 |
| | BUILDING UNIT HEATER ANNUAL PM -HRSG 2 | LMB - 46283825 | 46313241 |
| | BUILDING UNIT HEATER ANNUAL PM -STG BLDG | LMB - 46201386 | 46314408 |
| | BUILDING UNIT HEATER ANNUAL PM -SVC FILTER TRAILERS | LMB - 46201388 | 46314421 |
| | BUILDING UNIT HEATER ANNUAL PM -WAREHOUSE | LMB - 46201389 | 46314409 |
| Misc & Plant Specific | AUX BOILER A ANNUAL MAINTENANCE | LMB - 46201285 | 46312033 |
| | AUX BOILER B ANNUAL MAINTENANCE | LMB - 46201286 | 46312034 |
| | AUX BOILER SUPERHEATER ANNUAL MAINTENANCE | LMB - 46201294 | 46312036 |
| | CT1 INTAKE SNOW SCREENS, INSTALL - WINTER PREP | LMB-46248869-01 | 46314417 |
| | CT2 INTAKE SNOW SCREENS, INSTALL - WINTER PREP | LMB - 46248869-02 | 46314413 |
| | CT1 INSTALL DUCT INLET HEATERS - WINTER | LMB - 46249421 | 46314429 |
| | CT2 INSTALL DUCT INLET HEATERS - WINTER | LMB - 46249426 | 46314412 |
| | HRSG2 VALVE PACKING WALK-DOWN | | 46312031 |
| | HRSG1 VALVE PACKING WALK-DOWN | | 46312039 |
| | CT 1 WATER WASH SYSTEM WINTERIZE | | 46313823 |
| | CT 2 WATER WASH SYSTEM WINTERIZE | | 46314414 |
| | CT1 WINTERIZE POWER AUG STEAM SYSTEM | | 46314415 |
| | CT2 WINTERIZE POWER AUG STEAM SYSTEM | | 46314416 |
| | CONTRACTOR'S WASH STATION - WINTERIZE | | 46314418 |
| | CT2 EVAP COOLERS-WINTERIZE ANNUAL | | 46314427 |
| | CT1 EVAP COOLERS-WINTERIZE ANNUAL | | 46314430 |
| Pre-Winter Consumables & Supplies for Personnel | EMERGENCY FOOD STORAGE INVENTORY | LMB - 46202115 | 46314431 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Critical Equipment Freeze Protection Checklist | | | |
| | Cold Weather Critical Checks as Part of Daily Rounds | | Sample |
| | | | |
| Meetings | | | |
| | Chemical Levels Standing Order | | No Date |
| | 2022-23 Winter Heat Trace Mitigation Plan | | No Date |
| | Winter Ops Standing Orders | | No Date |

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# Plant Manager's Comments
## Summary of RF Plant Review

- It felt like an Operational review not a Compliance review
- Helped make the plants program more streamlined, less dispersed
  - Added more weatherization information on operator round sheets and in procedures
  - Weatherization program became more disciplined and accountable
- More of a collaborative meeting because plant and RF team where able to discuss ideas on how to address operational pain points in open atmosphere.