Duke Energy Company
MCGUIRE NUCLEAR STATION

VERIFICATION OF FREEZE PROTECTION EQUIPMENT AND SYSTEMS

Procedure No.
PT/0/B/4700/038

Revision No.
035

Continuous Use

PERFORMANCE

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Work Order/Task Number (WO#) 20387578

COMPLETION

- [x] Yes [ ] NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- [x] Yes [ ] NA Required attachments included?
- [ ] Yes [x] NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
- [ ] Yes [x] NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
- [x] Yes [ ] NA Procedure requirements met?

Verified By
** Printed Name and Signature* Otto Jakubowicz Otto Jakubowicz Date 10/20/2020

Procedure Completion Approved
** Printed Name and Signature* Melissa Silver Melissa Silver Date 10/20/20

Remarks (*attach additional pages, if necessary*)
MG - Grembecki
OJ - Otto Jakubowicz
MS - MARK STINSON

IMPORTANT: Do **NOT** mark on barcodes.

Attachment Number: *FULL*

Procedure No.: *PT/0/B/4700/038*

Printed Date: *10/17/20*

Revision No.: *035*

Duke Energy McGuire Nuclear Station **VERIFICATION OF FREEZE PROTECTION EQUIPMENT AND SYSTEMS** **Continuous Use**	Procedure No. PT/**0**/B/4700/038 Revision No. 035 Electronic Reference No. MC0047PF

Revision History (significant issues, limited to one page)

Rev 035 AR02194503: In response to SAST02176788 added Step 12.8 to place heaters in the foam cart houses in service to ensure foam is stored above freezing temperatures.

Rev 034 AR02168866: In response to NCR02167927 added new Section 12.22, which has been previously validated and reviewed for PT/0/B/4700/070, with step to check there is no water accumulation in all temporary equipment spill containments inside the Protected Area and a step to notify Environmental to check there is no water accumulation in all permanent equipment spill containments at the site outside of the Protected Area.

Rev 033 Included in this revision:

- AR01958929: Incorporated the requirements of new fleet procedure AD-EG-ALL-1523, Temporary Ignition Source Control. New Reference 2.2 and Limit and Precaution 6.1 added.
- AR1921873 and 01971555: EC-114213 describes installation of a new type of interior curtains (30) required to cover the three Unit 1 Exterior Doghouse West facing windows which are stored in a locally mounted weather curtain storage box. A Note was added to Section 12.5 describing this. Also a step was added to ensure the interior curtains are installed and closed.
- AR1969789: To alleviate NRC concerns related to timely action and proper positioning of Doghouse curtains Section 12.5 was created by combining former Steps 12.5 - 12.7 as sub-steps. An additional Step 12.5.5 was added for Maintenance **OR** SPOC to notify Operations of completion of Doghouse curtain positioning. Step 12.24 and associated Note were also added to provide Operations a HOLD point until notification by Maintenance **OR** SPOC of completion of Doghouse curtain positioning. These changes made per OSM mark up.

Rev 032 Per NCR01701348, "1RN-1078 is the discharge isolation for four (4) Service Building water cooled air handling units. These are SB AHU-7, 8, 12 & 13. These coolers are used to provide room temperature conditioning for electrical loads in the lower middle section of the Service Building. This equipment is NOT subject to sub-freezing temperatures due to significant plant thermal loads from the Turbine Building of both Unit 1 & 2". In response to this Step 12.17 closing 1RN-1078 has been removed.

Rev 031 Included in this revision:

- In response to NCR01678442 added Step 12.14 to notify Chemistry to evaluate isolating and draining Hot Machine Shop Chilled Water Chemical Feeder and the Radwaste Area Chilled Water Chemical Feeder.

VERIFICATION OF FREEZE PROTECTION EQUIPMENT AND SYSTEMS

1. Purpose

To check readiness of cold weather equipment and systems to ensure safe reliable operation of units during cold weather months.

2. References

2.1 NSD 317 (Freeze Protection Program)

2.2 AD-EG-ALL-1523, Temporary Ignition Source Control

3. Time Required

3.1 Two operators 12 hours.

3.2 Maintenance **OR** SPOC personnel to perform Steps 12.4, 12.5 **AND** 12.13 per Model Work Order 00429074.

4. Prerequisite Tests

None

5. Equipment Required

5.1 Key #297

6. Limits and Precautions

6.1 Installation of portable electric heaters to an area as supplement heat shall comply with AD-EG-ALL-1523, Temporary Ignition Source Control.

7. Unit Status

None

8. Prerequisite System Conditions

None

9. Test Method

An inspection to check operability of cold weather protection devices under Operations control will be performed. Cold weather protection devices and operational tests under control of other station groups will be checked to have been completed or operable.

10. Data Required

None

11. Acceptance Criteria

11.1 All required tests **AND** PM/PTs completed **AND** all discrepancies evaluated.

11.2 E Work Requests coded for freeze protection generated for all discrepancies.

11.3 Shift Manager **OR** Designee made aware of all discrepancies for evaluation.

12. Procedure

N/A SRO MC 12.1 **IF AT ANY TIME** there is the potential for freezing conditions which could affect safe reliable plant operation prior to full completion of this procedure,
THEN evaluate components **NOT** yet aligned for cold weather. [NCR01670962]

NOTE: PT/0/B/4700/021 (Plant Heating Water System Checkout And Startup) may be run concurrently with and completed after this procedure.

Steps 12.2 - 12.18 may be performed in any order or concurrently.

MC 12.2 Notify Engineering to evaluate any outstanding concerns associated with YH System **AND** performance of PT/0/B/4700/021 (Plant Heating Water System Checkout and Startup).

Voicemail Mike Wilder 10/12/20 1125
Person Notified Date Time

MC 12.3 Notify Work Control to ensure the following initiated **OR** scheduled:

☑ Monthly PMs for 1EHTLPXXX1 (Model W/O 00393879) 11/9/20
☑ Monthly PMs for 2EHTLPXXX1 (Model W/O 00393878) 11/9/20
☑ Annual PM for 0EHTLPXXX1 (Model W/O 00394758) 6/30/20

MC 12.4 Notify Maintenance **OR** SPOC to ensure Unit 1 **AND** Unit 2 Exterior Doghouse lower steam vent louvers closed per work order:

MC • Unit 1 Exterior Doghouse
MC • Unit 2 Exterior Doghouse

Mike Springs 10/11/20 / 0930
Person Notified Date Time

NOTE: Retainer pipes are not attached on all of the doghouse upper windows. Some doghouse windows openings only have one window (upper only).

For reference drawings on doghouse curtains see MC-1227-03 and MC-1227-04.

MG 12.5 Notify Maintenance **OR** SPOC to perform the following:

Mike Springs 10/7/20 / 0930
Person Notified Date Time

MS 12.5.1 MNT M. Springs
Ensure Unit 1 **AND** Unit 2 Interior **AND** Exterior Doghouse top steam vent curtains are lowered per work order: [NCR0164558 & NCR01661055]

- ☑ Unit 1 Interior Doghouse
- ☑ Unit 1 Exterior Doghouse
- ☑ Unit 2 Interior Doghouse
- ☑ Unit 2 Exterior Doghouse

NOTE: The interior curtains (30) required to cover the three Unit 1 Exterior Doghouse West facing upper windows are located in the local weather curtain storage box.

MS 12.5.2 MNT
Ensure the interior curtains for Unit 1 Exterior Doghouse West facing upper windows are installed **AND** closed.

☑ 12.5.3 For doghouses with windows with retainer pipes, curtains should be inside upper windows retainer pipes which will keep the doghouse curtains properly positioned due to atmospheric conditions.

CAUTION: If the doghouse window has two openings (windows), then it is prohibited to cover the lower window(s) (pressure concern) with any part of the curtains. [NCR0164558]

MS 12.5.4 MNT
For doghouses with windows that have two openings, ensure doghouse lower windows are **NOT** obstructed by curtain.

NOTE: Step 12.24 may be completed by Operations upon completion of the following step.

MS 12.5.5 MNT
Notify Operations that all doghouse curtains have been positioned.

12.6 Ensure Unit 1 **AND** Unit 2 CF Transmitter House Doors closed: (key #297)

- Unit 1 East CF Transmitter House
- Unit 1 West CF Transmitter House
- Unit 2 East CF Transmitter House
- Unit 2 West CF Transmitter House

NOTE: IAE adjusts and maintains heater set points for heaters in the Interior and Exterior Doghouses, CF Transmitter Houses and Fire Pump rooms.

12.7 Check Unit 1 **AND** Unit 2 Interior **AND** Exterior Doghouse area heaters are energized **AND** operable by performing the following:

12.7.1 Check the following closed for Unit 1:

- ☐ 1MXA-F3B (Unit 1 Interior Doghouse Heater 1VAUH0090)
- ☐ 1MXA-R4A (Unit 1 Interior Doghouse Heater 1VAUH0091)
- ☐ 1MXA-F1B (Unit 1 Exterior Doghouse Heater 1VAUH0094)
- ☐ 1MXA-F2B (Unit 1 Exterior Doghouse Heater 1VAUH0095)
- ☐ 1MXB-R4C (Unit 1 Interior Doghouse Heater 1VAUH0092)
- ☐ 1MXB-F4D (Unit 1 Interior Doghouse Heater 1VAUH0093)
- ☐ 1MXB-F2A (Unit 1 Exterior Doghouse Unit Heater 1VAUH0096)
- ☐ 1MXB-R2C (Unit 1 Exterior Doghouse Heater 1VAUH0097)

12.7.2 Check the following closed for Unit 2:

- ☐ 2MXA-R4B (Unit 2 Interior Doghouse Heater 2VAUH0090)
- ☐ 2MXA-R4A (Unit 2 Interior Doghouse Heater 2VAUH0091)
- ☐ 2MXA-R2C (Unit 2 Exterior Doghouse Heater 2VAUH0096)
- ☐ 2MXA-R1B (Unit 2 Exterior Doghouse Heater 2VAUH0097)
- ☐ 2MXB-R4C (Unit 2 Interior Doghouse Heater 2VAUH0093)
- ☐ 2MXB-R2C (Unit 2 Interior Doghouse Heater 2VAUH0092)
- ☐ 2MXC-F1B (Unit 2 Exterior Doghouse Heater 2VAUH0094)
- ☐ 2MXC-F3B (Unit 2 Exterior Doghouse Heater 2VAUH0095)

N/A 12.7.3 **IF** ambient air temperature near heater less than **OR** equal to 45°F, **THEN** check heaters on.

NOTE: Foam Cart House heaters are required to be in service in cold weather to ensure foam is stored above freezing temperatures. [SAST02176788]

12.8 Place heaters in the following foam cart houses in service:

- ☐ Unit 1 Foam Cart House
- ☐ Unit 2 Foam Cart House

NOTE: Doghouse temperatures must be maintained greater than 40°F to ensure VI System air components remain above dew point.

12.9 Check the following OAC points in service **AND** corresponding doghouse temperatures greater than 40°F:

- ☑ M1A0174 (U1 Inboard Doghouse Area Temp #1)
- ☑ M1A0691 (U1 Inboard Doghouse Area Temp #2)
- ☑ M1A0781 (U1 Outboard Doghouse Area Temp #1)
- ☑ M1A0787 (U1 Outboard Doghouse Area Temp #2)
- ☑ M2A0174 (U2 Inboard Doghouse Area Temp #1)
- ☑ M2A0691 (U2 Inboard Doghouse Area Temp #2)
- ☑ M2A0781 (U2 Outboard Doghouse Area Temp #1)
- ☑ M2A0787 (U2 Outboard Doghouse Area Temp #2)

12.10 Check power available to Fire Pump room **AND** Screen Backwash room heaters by checking the following closed:

- ☑ SMXI-F1A (Traveling Screen Backwash Pump Room Unit Heater (FPR-EH-2))
- ☑ SMXI-F1B (A Main Fire Pump Room Unit Heater (FPR-EH-1))
- ☑ SMXI-F1C (B Main Fire Pump Room Unit Heater (FPR-EH-3))
- ☑ SMXI-F1D (C Main Fire Pump Room Unit Heater (FPR-EH-4))

12.11 Check power available to CF Transmitter House heaters by checking the following closed:

- ☑ 1MXNA-4H (Unit 1 CF Transmitter House Heaters 1VAUH0101 & 1VAUH0103)
- ☑ 1MXMA-4C (Unit 1 CF Transmitter House Heaters 1VAUH0100 & 1VAUH0102)
- ☑ 2MXNA-4H (Unit 2 CF Transmitter House Heaters 2VAUH0101 & 2VAUH0103)
- ☑ 2MXMA-4B (Unit 2 CF Transmitter House Heaters 2VAUH0100 & 2VAUH0102)

12.12 Check the following OAC points in service **AND** corresponding CF Transmitter House temperatures are greater than 45°F:

- ☑ M1A1301 (U1 East CF Transmitter House Temp)
- ☑ M1A1307 (U1 West CF Transmitter House Temp)
- ☑ M2A1301 (U2 East CF Transmitter House Temp)
- ☑ M2A1307 (U2 West CF Transmitter House Temp)

MC 12.13 Notify HVAC Maintenance **OR** SPOC to ensure Turbine Building ventilation properly aligned for weather conditions per work order as follows:

- ☑ Turbine Building Intake Louvers correctly positioned
- ☑ Appropriate number of supply **AND** exhaust fans in service
- ☑ Unit heaters operating properly

D. Goffey 10/17/20 1630
Person Notified Date Time

X 12.14 Notify Chemistry to evaluate isolating **AND** draining the following: [NCR01678442]

- ☑ Radwaste Area Chilled Water Chemical Feeder
- ☑ Hot Machine Shop Chilled Water Chemical Feeder

Ayesha Williams 10/17/20 0951
Person Notified Date Time

X - Ayesha Williams

X 12.15 Notify Environmental Chemistry to ensure the following are protected **OR** aligned for cold weather conditions:

- ☑ All Chemistry Portable Eye Wash stations
- ☑ All Chemistry Permanent Eye Wash stations
- ☑ All Safety Showers

Ayesha Williams 10/17/20 0951
Person Notified Date Time

MS 12.16 Complete Enclosure 13.1 (RV to VA and VF Supply AHUs Isolation).

MC 12.17 Check building heating equipment operational in the Outsourced Water Treatment Building. [NCR01676765] 2150

NOTE: The Operations truck does not require tire chains to be installed, the tire chains must be available for installation when needed.

☑ 12.18 Check tire chains available for the Operations truck.

12.19 Check the following energized with no alarms:

- ☑ 1EHTTC0001 (FWST Normal Heat Trace Controller)
- ☑ 1EHTTC0002 (FWST Emerg Heat Trace Controller)
- ☑ 2EHTTC0001 (FWST Normal Heat Trace Controller)
- ☑ 2EHTTC0002 (FWST Emerg Heat Trace Controller)

NA 12.20 **IF** "Low Limit Alarm" lit on any Units FWST Heat Trace Panel,
THEN place the Emerg Heat Trace Controller for that Unit in "OVERRIDE" as applicable:

- 1EHTTC0002 (FWST Emerg Heat Trace Controller)
- 2EHTTC0002 (FWST Emerg Heat Trace Controller)

NA 12.21 **IF** either Unit Emerg Heat Trace Controller placed in "OVERRIDE",
THEN notify Engineering for further guidance.

_____ _____/_____
Person Notified Date Time

12.22 Evaluate temporary equipment spill containments by performing the following:

☑ 12.22.1 Check there is no water accumulation in all temporary equipment spill containments inside the Protected Area. [NCR02167927]

N/A MB 12.22.2 **IF** any water accumulation is located in any temporary equipment spill containments,
THEN generate Work Requests if required to ensure any water accumulation is removed.

MB 12.22.3 Notify Environmental to check for water accumulation in all permanent equipment spill containments at the site outside of the Protected Area. [NCR02171058]

G. Beaver 10/19/20 / 0812
Person Notified Date Time

NA OR 12.23 **IF** any discrepancies exist,
THEN discrepancy sheet shall be reviewed by Shift Manager **OR** Designee for evaluation of actions required addressing cold weather concerns.

NOTE:	The following step may be signed off upon Maintenance or SPOC notification.

MB 12.24 **HOLD** until notified by Maintenance **OR** SPOC that all doghouse curtains have been positioned.

M. Scaings 10/18/20 / 0822
Person Notified Date Time

13. Enclosures

13.1 RV to VA and VF Supply AHUs Isolation

End of Body

Enclosure 13.1

RV to VA and VF Supply AHUs Isolation

1. Isolation of RV to VA and VF Supply Units

NOTE: WL drain header for AHU may be used to drain RV coils to WZ Sump A.

NS 1.1 Contact Radwaste Operator to determine proper location to direct RV drainage.

☑ 1.2 Prepare tags per Preplan PP-00559.

NOTE: Sections 1.3 - 1.8 may be performed in any order.

1.3 Perform the following to isolate 1A Aux Bldg Supply AHU:

M 1.3.1 Tag closed 1RV-26 (1A VA AHU RV Inlet Isol).

NS 1.3.2 Tag closed 1RV-27 (1A VA AHU RV Outlet Isol).

NOTE: The hose hookups in the following step are required to be maintained in place to ensure any leakage of RV will drain and coils will not freeze during winter. These hose hookups are not Temporary Modifications.

1.3.3 Remove pipe caps **AND** route drainage hose to location determined in Step 1.1 for:

☑ 1RV-460 (1A VA AHU RV Drn)
☑ 1RV-462 (1A VA AHU RV Drn)

NS 1.3.4 Open 1RV-460 (1A VA AHU RV Drn).

NS 1.3.5 Open 1RV-462 (1A VA AHU RV Drn).

NS 1.3.6 Open 1RV-459 (1A VA AHU RV Vt).

NS 1.3.7 Open 1RV-461 (1A VA AHU RV Vt).

Enclosure 13.1

RV to VA and VF Supply AHUs Isolation

1.4 Perform the following to isolate 1B Aux Bldg Supply AHU:

1.4.1 Tag closed 1RV-21 (1B VA AHU RV Inlet Isol).

1.4.2 Tag closed 1RV-22 (1B VA AHU RV Outlet Isol).

NOTE: The hose hookups in the following step are required to be maintained in place to ensure any leakage of RV will drain and coils will not freeze during winter. These hose hookups are not Temporary Modifications.

1.4.3 Remove pipe caps **AND** route drainage hose to location determined in Step 1.1 for:

- ☐ 1RV-464 (1B VA AHU RV Drn)
- ☐ 1RV-466 (1B VA AHU RV Drn)

1.4.4 Open 1RV-464 (1B VA AHU RV Drn).

1.4.5 Open 1RV-466 (1B VA AHU RV Drn).

1.4.6 Open 1RV-463 (1B VA AHU RV Vt).

1.4.7 Open 1RV-465 (1B VA AHU RV Vt).

Enclosure 13.1

RV to VA and VF Supply AHUs Isolation

1.5 Perform the following to isolate U1 Spent Fuel Pool Supply AHU:

1.5.1 Tag closed 1RV-16 (Unit 1 VF AHU RV Inlet Isol).

1.5.2 Tag closed 1RV-17 (Unit 1 VF AHU RV Outlet Isol).

NOTE: The hose hookups in the following step are required to be maintained in place to ensure any leakage of RV will drain and coils will not freeze during winter. These hose hookups are not Temporary Modifications.

1.5.3 Remove pipe caps **AND** route drainage hose to location determined in Step 1.1 for:

- ☐ 1RV-468 (Unit 1 VF AHU RV Drn)
- ☐ 1RV-470 (Unit 1 VF AHU RV Drn)

1.5.4 Open 1RV-468 (Unit 1 VF AHU RV Drn).

1.5.5 Open 1RV-470 (Unit 1 VF AHU RV Drn).

1.5.6 Open 1RV-467 (Unit 1 VF AHU RV Vt).

1.5.7 Open 1RV-469 (Unit 1 VF AHU RV Vt).

Enclosure 13.1

RV to VA and VF Supply AHUs Isolation

1.6 Perform the following to isolate 2A Aux Bldg Supply AHU:

1.6.1 Tag closed 2RV-26 (2A VA AHU RV Inlet Isol).

1.6.2 Tag closed 2RV-27 (2A VA AHU RV Outlet Isol).

NOTE: The hose hookups in the following step are required to be maintained in place to ensure any leakage of RV will drain and coils will not freeze during winter. These hose hookups are not Temporary Modifications.

1.6.3 Remove pipe caps **AND** route drainage hose to location determined in Step 1.1 for:

☐ 2RV-460 (2A VA AHU RV Drn)
☐ 2RV-462 (2A VA AHU RV Drn)

1.6.4 Open 2RV-460 (2A VA AHU RV Drn).

1.6.5 Open 2RV-462 (2A VA AHU RV Drn).

1.6.6 Open 2RV-459 (2A VA AHU RV Vt).

1.6.7 Open 2RV-461 (2A VA AHU RV Vt).

Enclosure 13.1

RV to VA and VF Supply AHUs Isolation

1.7 Perform the following to isolate 2B Aux Bldg Supply AHU:

NS 1.7.1 Tag closed 2RV-21 (2B VA AHU RV Inlet Isol).

NS 1.7.2 Tag closed 2RV-22 (2B VA AHU RV Outlet Isol).

NOTE: The hose hookups in the following step are required to be maintained in place to ensure any leakage of RV will drain and coils will not freeze during winter. These hose hookups are not Temporary Modifications.

1.7.3 Remove pipe caps **AND** route drainage hose to location determined in Step 1.1 for:

☑ 2RV-464 (2B VA AHU RV Drn)
☑ 2RV-466 (2B VA AHU RV Vt)

NS 1.7.4 Open 2RV-464 (2B VA AHU RV Drn).

NS 1.7.5 Open 2RV-466 (2B VA AHU RV Vt).

NS 1.7.6 Open 2RV-463 (2B VA AHU RV Vt).

NS 1.7.7 Open 2RV-465 (2B VA AHU RV Vt).

Enclosure 13.1

RV to VA and VF Supply AHUs Isolation

1.8 Perform the following to isolate Unit 2 Spent Fuel Pool Supply AHU:

1.8.1 Tag closed 2RV-16 (Unit 2 VF AHU RV Inlet Isol).

1.8.2 Tag closed 2RV-17 (Unit 2 VF AHU RV Outlet Isol).

NOTE: This hose hookup is required to be maintained in place to ensure any leakage of RV will drain and coils will not freeze during the winter. These hoses are not a Temporary Modification.

1.8.3 Remove pipe caps **AND** route drainage hose to location determined in Step 1.1 for:

☑ 2RV-468 (Unit 2 VF AHU RV Drn)
☐ 2RV-470 (Unit 2 VF AHU RV Drn)

1.8.4 Open 2RV-468 (Unit 2 VF AHU RV Drn).

1.8.5 Open 2RV-470 (Unit 2 VF AHU RV Drn).

1.8.6 Open 2RV-467 (Unit 2 VF AHU RV Vt).

1.8.7 Open 2RV-469 (Unit 2 VF AHU RV Vt).

End of Enclosure