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CALLAWAY PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EIP-ZZ-00231

RESPONSE TO SEVERE THUNDERSTORM/HIGH WINDS/TORNADO WATCHES AND WARNINGS

RESPONSIBLE DEPARTMENT Emergency Preparedness

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This procedure contains the following:

Pages	1	through	10
Attachments	1	through	4
Tables		through	
Figures		through	
Appendices		through	
Checkoff Lists		through	

This procedure has 0 checkoff list(s) maintained in the mainframe computer.

Conversion of commitments to TRS reference/hidden text completed by Revision Number:

Non-T/S Commitments

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RESPONSE TO SEVERE THUNDERSTORM/HIGH WINDS/TORNADO WATCHES AND WARNINGS

1 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure establishes the method for responding to severe thunderstorm watches, thunderstorm warnings, high winds, tornado watches, or tornado warnings.

1.2 SCOPE

1.2.1 Establishes:

a. The means of notifying plant workers of severe weather.
b. The response of plant workers to severe weather.
c. Emergency actions necessary to be taken in the case of severe weather.
d. The procedures necessary to control the opening and closing of specified missile shields.
e. Requirements associated with placing a Sea-land container on the roof the Diesel Generator Building(s).

2 DEFINITIONS

2.1 APPROACHING (severe levels) - A thunderstorm which contains winds of 40 to 57 mph, or hail 1/2 inch or larger but less than 3/4 inch in diameter.

2.2 FUNNEL CLOUD - A condensation funnel extending from the base of a towering Cumulus or Cumulonimbus cloud (Cb), associated with a rotating column of air that is not in contact with the ground (and hence different from a tornado).

2.3 HIGH WINDS - Winds in excess of 40 mph (18 m/s) sustained, or 58 mph (26 m/s) gusting.

2.4 National Oceanic and Atmospheric Administration (NOAA) - An organization of the U.S. Commerce Department. NOAA's National Weather Service keeps a round-the-clock vigil on atmospheric conditions and issues watches and warnings for severe atmospheric conditions. A weather radio which can receive NOAA weather announcements is located in the Control Room, in the Shift Supervisor's office, and is activated when local severe weather conditions exist.

2.5 SEVERE THUNDERSTORM - A thunderstorm which produces tornadoes, hail 0.75 inches or more in diameter, or winds of 58 mph or more. Structural wind damage may imply the occurrence of a severe thunderstorm. See approaching (severe).

2.6 THUNDERSTORM – Rain clouds producing lightning.

2.7 TORNADO WATCH - Identifies an area where conditions are favorable for a tornado formation.

2.8 TORNADO WARNING - A tornado warning means that a tornado has been sighted or indicated by weather radar.

2.9 TORNADO - A violently rotating column of air in contact with the ground and extending from the base of a thunderstorm. A condensation funnel does not need to reach to the ground for a tornado to be present; a debris cloud beneath a thunderstorm is all that is needed to confirm the presence of a tornado, even in the total absence of a condensation funnel.

2.10 WARNING - Issued by NWS local offices indicating that a particular weather hazard is either imminent or has been reported. A warning indicates the need to take action to protect life and property. The type of hazard is reflected in the type of warning (e.g., tornado warning, blizzard warning).

2.11 WATCH - A National Weather Service (NWS) product indicating that a particular hazard is possible, i.e., that conditions are more favorable than usual for its occurrence. A watch is a recommendation for planning, preparation, and increased awareness (i.e., to be alert for changing weather, listen for further information, and think about what to do if the danger materializes).

3 RESPONSIBILITIES

3.1 SHIFT SUPERVISOR

3.1.1 Ensures Attachment 1, Announcements for High Winds/Tornado's, is completed during severe thunderstorm watches, high winds, tornado watches, or tornado warnings.

3.1.2 Ensures precautionary actions (Section 5.0) are taken when severe weather occurs in Callaway County.

3.1.3 Ensures proper weather monitoring when opening missile shields for operable safety related equipment.

3.1.4 The Shift Supervisor performs additional notifications using Policy OPS-COMMUNICATIONS-01.

3.1.5 Ensure proper weather monitoring when switchyard maintenance is being performed to allow sufficient time for loose equipment to be moved or tied down/secured.

3.2 DEPARTMENT HEADS AND SUPERVISORY PERSONNEL

3.2.1 Department heads and plant supervisory personnel are responsible for ensuring that personnel performing work at locations outside the range of plant announcements are notified of severe thunderstorm watches, thunderstorm warnings, high winds, tornado watches, or tornado warnings, if possible. Areas of concern included:

- Personnel in vehicles.
- Personnel performing work in remote locations.
- Storeroom 2 level 'A' and 'B' Storage.
- Restroom facilities.

3.2.2 Establish weather-monitoring requirements for activities associated with Steps 6, 7 and 8 of this procedure.

3.3 ADMINISTRATION DEPARTMENT

Administration ensures that updated copies of Attachment 2, Tornado's, are posted and remain visible on plant bulletin boards.

3.4 PLANT EMPLOYEES

3.4.1 Plant employees are responsible for following the protective action recommendations made over the plant Gai-tronics.

3.4.2 Plant employees have the responsibility to become familiar with the location of designated shelters, or actions to be taken should these shelters not be readily accessible. Locations and actions are listed in Attachment 2, Tornado's. **CARS 200101381 CARS 200101749 CARS 200101796**

4 NOTIFICATION AND PROTECTION OF PLANT PERSONNEL

4.1 When weather conditions for Callaway County broadcasted over the NOAA weather radio report thunderstorm watches and warnings, high winds, and tornado watches and warnings, plant personnel must be notified in accordance with Attachment 1, Announcements for Severe Thunderstorm/High Winds/Tornados Sections A through E.

4.2 When Thunderstorm or Tornado Warnings are in effect for Callaway County, outside work should be suspended until the warning is no longer in affect.

4.3 When the weather conditions no longer exist, an all-clear announcement must be made in accordance with Attachment 1, Announcements for Severe Thunderstorm/High Winds/Tornados Section F.

5 ACTIONS TO PROTECT CALLAWAY PLANT

5.1 ACTIONS FOR ALL SEVERE WEATHER CONDITIONS IN CALLAWAY COUNTY

5.1.1 Doors listed on Attachment 3, High Winds/Tornado Door Closure List, should be closed if possible. Any door that is unattended and cannot be readily closed should be evaluated by the SS/CRS to determine if the door may be opened.

NOTE:	Access through a door is not intended to be restricted by this procedure. Access is a personal judgement depending on conditions.

5.1.2 Direct Security (CAS/SAS) to verify that all monitored doors listed on Attachment 3, Section A, are closed or capable of being closed by personnel at the door.

5.1.3 Direct Watch station Equipment Operators to verify that all doors listed on Attachment 3, Section B, are closed or capable of being closed by personnel at the door.

5.1.4 Inspect the switchyard and other outside areas for loose equipment that should be moved or tied down. **COMN 41813**

5.1.5 Frequent tours should be made to assess any imminent problems.

CAUTION:	Personnel should not be sent to ensure both turbine building cranes' tornado locks are engaged if a Severe Storm is present at the site.

5.1.6 Direct Maintenance to ensure that both turbine building cranes' tornado locks are engaged if not in use or before the storm reaches the plant.

5.1.7 Review Section 6 to ensure missile shields are in place as required.

5.1.8 Shut down the plant if safe operation is in jeopardy or significant damage is imminent.

5.1.9 Assess current and projected plant configurations with respect to plant risk in accordance with **EDP-ZZ-01129**, Callaway Plant Risk Assessment, prior to taking equipment out of service and to decide if out of service equipment can be returned to service.

5.2 FOR THUNDERSTORM AND TORNADO WARNINGS

CAUTION:	If actions taken to protect personnel will result in non-compliance with the Security Plan, a one hour notification to the NRC may be required per 10CFR73, Appendix G Section I(c). Consider invoking 10CFR50.54 (x) and (y), which authorize reasonable actions that depart from license conditions or technical specifications that are taken in an emergency to protect public health and safety. **CARS 200101800**

5.2.1 Stop the performance of any surveillance procedure that might make any Engineered Safety Feature inoperable. **COMN 41813**

5.2.2 Verify both emergency diesel generators are aligned for automatic start per **OTN-NE-0001A**, Standby Diesel Generation System - Train "A", and **OTN-NE-0001B**, Standby Diesel Generation System - Train "B". **COMN 41813**

5.2.3 Stop all activities associated with fuel handling and processing of radioactive materials as soon as practical but before the storm reaches the plant.

5.2.4 Inform the outside operator and outside security personnel to alert the Control Room of changes in weather conditions including:

- Funnel clouds
- Dust or debris at the surface below a cloud base
- Large hail (3/4" or greater in diameter)
- Loud roaring noise associated with the storm

5.2.5 For Tornado Warnings, close the Control Room Missile Door 36042, Control Room foyer to the Comm. Corridor.

5.2.6 Update Safety Monitor per **OOA-ZZ-SM001**, Safety Monitor.

5.2.7 When Tornado Warnings occur, the Shift Supervisor MUST perform notifications using OPS-COMMUNICATIONS-01 policy.

5.3 ACTIONS SUBSEQUENT TO A TORNADO STRIKING CALLAWAY PLANT BUILDINGS

5.3.1 Refer to **EIP-ZZ-00101**, Classification of Emergencies to determine the appropriate emergency classification.

5.3.2 When weather conditions become favorable, accountability should be declared using **EIP-ZZ-00230**, Accountability.

5.3.3 Expedite the restoration of important plant systems and components to service, as applicable. **COMN 41813**

6 MISSILE SHIELD REMOVAL (RFR 019618B)

6.1 Prior to removing a missile shield included in Attachment 4, Missile Shield Requirements, assess current and future weather conditions for the next 48 hours. This assessment should include the monitoring distances as identified in Attachment 4 for the particular missile shield that is going to be opened. If the work is urgent, a smaller forecast period may be used.

6.2 Contact Security at the Key Issue Station to perform weather monitoring. Advise security of the monitoring distance based on the missile shield that will be opened as identified in Attachment 4, Missile Shield Requirements.

NOTE:	Security will contact Surface Systems, Inc. (SSI) in St. Louis, MO. SSI is under contract with Ameren to provide weather monitoring and forecasting. SSI phone numbers are 800.994.7947 and 314.872.0560. Security will call hourly for updates of weather conditions and SSI will contact Security if conditions change.

6.3 Prior to opening the missile shield, refer to Attachment 4 and verify sufficient resources are available to close the shield.

NOTE:	The diesel generators are not considered inoperable when the missile cover is removed from the emergency diesel fuel oil storage tanks so long as appropriate administrative controls are followed to ensure adequate missile protection is maintained. These controls include: limiting the time the cover may be removed to 36 consecutive hours, maintaining the cover rigged to the crane with personnel stationed to facilitate immediate replacement, and monitoring weather forecasts and local conditions to allow immediate replacement of the cover, if necessary. Refer to Basis **T/S LCO 3.8.3**

6.4 An information EOSL should be initiated for the shield to be removed.

6.5 If, when a missile shield is open, a thunderstorm or tornado is discovered in the monitoring distance for the particular missile shield, the Shift Supervisor must make a determination if the storm is moving toward the plant. **CARS 200101562**

6.5.1 If the thunderstorm or tornado is in the monitoring area and IS moving toward the plant, actions must be taken to immediately close the missile shield.

6.5.2 If the thunderstorm or tornado is in the monitoring area and it IS NOT moving toward the plant, the Shift Supervisor MUST ensure the storm continues to be monitored to ensure it is not moving toward the plant. If it is not moving toward the plant, the missile shields may remain open.

7 SEA-LAND CONTAINERS ON THE DIESEL GENERATOR BUILDING ROOF (RFR 020026A)

7.1 The Activity Coordinator responsible for placing a Sea-Land Container on the D/G Roof must notify the Control Room and then Security to initiate weather monitoring for thunderstorms within a 70-mile radius of the plant.

8 SWITCHYARD ACTIVITIES

8.1 The Activity Coordinator responsible for Switchyard maintenance and modification activities is responsible for monitoring severe weather conditions within 140 miles of Callaway Plant. The Activity Coordinator should ensure that the ability is maintained to remove or secure loose equipment within two hours following identification of impending severe weather.

9 REFERENCES

9.1 U.S. Department of Commerce (USDC), National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), NOAA/PA 82001 "Tornado Safety - Surviving Nature's Most Violent Storms", January, 1982

9.2 USDC-NOAA-NWS, NOAA/PA 76015 "NOAA Weather Radio", Revision April, 1985

9.3 USDC-NOAA-NWS, NOAA/PA 81011, "Spotter's Guide for Identifying and Reporting Local Storms" Revision April, 1982

9.4 USDC-NOAA-NWS, Technical Memorandum NWS SR-145, A Comprehensive Glossary Of Weather Terms For Storm Spotters

9.5 **EDP-ZZ-01129**, Callaway Risk Assessment

9.6 **EIP-ZZ-00101**, Classification of Emergencies

9.7 **EIP-ZZ-00230**, Accountability

9.8 **OOA-ZZ-SM001**, Safety Monitor

9.9 **OTN-NE-0001A**, Standby Diesel Generation System - Train "A"

9.10 **OTN-NE-0001B**, Standby Diesel Generation System - Train "B"

9.11 FSAR, Section 3.3

9.12 National Weather Service Operations Manual Chapter C.42

9.13 NUMARC 87-00

9.14 **RFR 019618B**

9.15 **RFR 020026A**

10 RECORDS

None

ANNOUNCEMENTS FOR SEVERE THUNDERSTORM/HIGH WINDS/TORNADOS

A. SEVERE THUNDERSTORM WATCH/HIGH WINDS

☐ GAI-TRONICS ANNOUNCEMENT

"Attention all personnel. Attention all personnel. Conditions are favorable for the occurrence of (circle one) severe thunderstorms / high winds in the area. Be prepared to act quickly in the event conditions worsen."
(REPEAT ANNOUNCEMENT)

B. SEVERE THUNDERSTORM WARNING

☐ SOUND THE PLANT EMERGENCY ALARM

"Attention all personnel. Attention all personnel. A Severe Thunderstorm Warning has been issued. Review the Tornado posting on the bulletin boards and be prepared to act quickly in the event the condition worsens."
(REPEAT ANNOUNCEMENT)

☐ Contact the outside operator and security to alert the Control Room of indications of tornado's around the site.

C. TORNADO WATCH

☐ SOUND THE PLANT EMERGENCY ALARM

☐ GAI-TRONICS ANNOUNCEMENT

"Attention all personnel. Attention all personnel. A tornado watch has been issued for Callaway County. Review the Tornado posting on bulletin boards and be prepared to act quickly in the event that conditions worsen."
(REPEAT ANNOUNCEMENT)

☐ Contact the outside operator and security to alert the Control Room of indication of tornado's around the site.

D. TORNADO WARNING IN CALLAWAY COUNTY

☐ SOUND THE PLANT EMERGENCY ALARM

☐ GAI-TRONICS ANNOUNCEMENT

"Attention all personnel. Attention all personnel. A tornado warning has been issued for Callaway County. All outside activities should be suspended until further notice. All personnel should be prepared to take cover should the need arise."
(REPEAT ANNOUNCEMENT)

☐ RADIO ANNOUNCEMENT

(Repeat Gai-tronics announcement)

E. TORNADO WARNING FOR CALLAWAY PLANT - Storm front moving toward the plant or actual sighting of a tornado by plant personnel.

☐ SOUND THE PLANT EMERGENCY ALARM

☐ GAI-TRONICS ANNOUNCEMENT

"Attention all personnel. Attention all personnel. A tornado warning is in effect for the Callaway Plant. Go directly to a designated tornado shelter area and seek cover."
(REPEAT ANNOUNCEMENT)

☐ RADIO ANNOUNCEMENT

(Repeat Gai-tronics announcement.)

F. ALL CLEAR

☐ GAI-TRONICS ANNOUNCEMENT

"Attention all personnel. Attention all personnel. The (circle one) severe thunderstorm watch / thunderstorm warning / high winds warning / tornado watch / tornado warning is no longer in effect. Continue normal work functions."
(REPEAT ANNOUNCEMENT).

☐ RADIO ANNOUNCEMENT

(Repeat Gai-tronics announcement.)

TORNADOS!!

- When a tornado warning is announced over the Gaitronics, go to the closest area designated below and take immediate cover.
- If time allows, a safer location (i.e. concrete building) may be used. However don't take a chance if weather is severe!
- If you are responsible for people in outside areas or in trailers, attempt to contact them.
- Avoid the use of elevators
- Close all doors between your shelter location and outside areas (including hallway and room doors).
- Stay away from windows.
- Go to an inside room and get under a desk or table if you cannot reach your designated shelter area prior to arrival of dangerous weather.

SERVICE BUILDING	First and second floor personnel: ▪ West corridor, Work Control Offices, Restrooms and Locker rooms, Room 105 (reprographics behind the QA wall). Third floor personnel, personnel in smoking room and NRC offices: ▪ East corridor, NRC offices, Telephone Rooms
TRAINING CENTER	▪ Lunch Room, Rest Rooms, Classrooms 120/122
TECHNICAL SUPPORT CENTER	▪ All areas other than near outside doorways
STOREROOM No. 1	▪ QA Non-Conforming Storage Temperature and Humidity Control Room (Note: Building has a metal roof, stay low, and cover head).
STORES No. 2	▪ Restrooms in office complex
HP CALIBRATION FACILITY	▪ Go to ESW Pumphouse
ANNEX	▪ Go to ESW Pumphouse
TURBINE BUILDING	▪ Cold Lab, Aux Feed Pump hallways and room, Health Physics Access Control Area
POWER BLOCK	▪ Auxiliary, Rad Waste, Diesel, and Control Bldgs.
EMERGENCY OPERATIONS FACILITY	▪ All areas except near outside doorways
CENTRAL PROCESSING FACILITY	▪ Inner hallways, bathrooms. (Note: Building has a metal roof, stay low, and cover head).
SECURITY OFFICES	▪ Go to the TSC
MAF	▪ Go to MAF basement
OUTAGE MAINTENANCE FACILITY	▪ Go to first floor restrooms and central hallway. If additional space is needed, stay in the center of the building. Close all exit and roll-up doors.
CALLAWAY MULTI-PURPOSE BUILDING	▪ First floor interior hallways, bathrooms, and locksmith area
ALL OTHER AREAS	▪ Go to the nearest shelter area, if one can be reached quickly (30-60 seconds). Otherwise take immediate cover in a concrete structure, below ground level area, a corner, or underneath a heavy object such as a desk or table.
IF CAUGHT OUTSIDE AS A LAST RESORT	▪ Take shelter in the nearest ditch or ground depression. Always cover your head —Remember, most tornado fatalities are from injuries to the head.

NEVER REMAIN IN TRAILERS OR VEHICLES
DO NOT REMOVE THIS NOTICE FROM THE BULLETIN BOARD.

ATTACHMENT 2
CA-#2022

SEVERE THUNDERSTORM/HIGH WINDS/TORNADOS DOOR CLOSURE LIST

Section A (Monitored Doors)

Door #	Building	Level	Type	Description
11021	Auxiliary	1974'	Pressure	Aux. Bldg. to Radwaste Tunnel.
11022	Auxiliary	1974'	Pressure	Aux. Bldg. to Radioactive Tunnel
11194	Auxiliary	2000'	Pressure	Aux. Bldg. to Fuel Bldg.
11195	Auxiliary	2000'	Pressure	Aux. Bldg. Outside Door
11273	Auxiliary	2043'4"	Pressure	Aux. Bldg. to MSIV Room
13011	Auxiliary	2000'	Missile	Aux. Bldg. to Outside Door
13012	Auxiliary	2000'	Pressure	Aux. Bldg. to Outside Door
13291	Auxiliary	2000'	Pressure	Turb. Bldg. to AFWP Rms.
13331	Auxiliary	2000'	Missile	Aux. Bldg. to Laundry/Decon Facility
14032	Auxiliary	2026'	Missile	Aux. Bldg. to Comm. Corridor
14081	Auxiliary	2026'	Pressure	Aux. Bldg. to Fuel Bldg.
15041	Auxiliary	2047'6"	Missile	Aux. Bldg. to RAM Storage Bldg.
15071	Auxiliary	2047'6"	Pressure	Aux. Bldg. to Fuel Bldg.
21011	Auxiliary	1974'	Pressure	Aux. Bldg. to Tendon Access Gallery
31011	Control	1974'	Pressure	Control Bldg. to Comm. Corridor
32013	Control	2000'	Pressure	Control Bldg. Outside Door
33012	Control	2000'	Missile	Control Bldg. to Comm. Corridor
33044	Auxiliary	2000'	Missile	Aux. Bldg. to Comm. Corridor
34021	Control	2016'	Missile	Control Bldg. to Comm. Corridor
35021	Control	2032'	Missile	Control Bldg. to Comm. Corridor
38011	Control	2073'6"	Missile	Control Bldg. to Comm. Corridor
41011	Auxiliary	1974"	Pressure	Aux. Bldg. to Turb. Bldg. Stairs
41015	Auxiliary	2026'	Missile	Aux. Bldg. to Turb. Bldg. Stairs
41017	Auxiliary	2047'6"	Missile	Aux. Bldg. to Turb. Bldg. Stairs
52011	Diesel Gen.	2000'	Missile	DG Bldg. Outside Door
52031	Diesel Gen.	2000'	Missile	DG Bldg. Outside Door
61011	Fuel Bldg.	2000'		South Emergency Exit
61021	Fuel Bldg.	2000'		East Emergency Door
61022	Fuel Bldg.	2000'		Roll-Up Door
U1041	ESW	2000'		ESW Pumphouse Outside Door
U1051	ESW	2000'		ESW Pumphouse Outside Door
U3011	UHS	2000'	Missile	UHS Cooling Tower Outside Door
U3041	UHS	2000'	Missile	UHS Cooling Tower Outside Door
U3061	UHS	2035'	Missile	UHS Cooling Tower Outside Door

Section B (Visually Verified Doors)

Building	Level	Door #	Type	Description
Control	1984'	32201	Pressure	Control Bldg. (HP) to Comm. Corridor
Control	1984'	32282	Pressure	Control Bldg. to Hot Lab
RAM Storage	2047	85011	Pressure	Walk-Out Door to Diesel Gen. Roof
RAM Storage	2047'	85012		Equipment Door to Diesel Gen. Roof
Turbine	2000'	ALL		All Roll-Up and Walk Through Doors
Reactor	2000'		Pressure	Personnel Emergency Hatch

MISSILE SHIELD REQUIREMENTS

MISSILE SHIELD	EST. CLOSURE TIME	WEATHER MONITORING DISTANCE	APPLICABLE MODES	Notes
Containment Equipment Hatch MSDSM52	2 hrs	140 mi.	5 & 6	Assumes the cart track is installed. Shields are required to be closed in modes 1, 2, 3, & 4.
Closure Resources Needed: Equipment Hatch Pedestal Crane, crane operator, * and secondary crane capable of lifting 4 tons at the equipment hatch platform, platform insert rigging, hand tools, cutting torch, HP Tech., labor for moving the shield, rigging, lifting, and shield winches *Note: Pedestal Crane and secondary crane availability is necessary only when the upper internals are removed and any fuel is in containment and there are any obstructions (track, LSA boxes, insert, etc.) in the path of the missile shield per Condition Tag 818687.				
MISSILE SHIELD	**EST. CLOSURE TIME**	**WEATHER MONITORING DISTANCE**	**APPLICABLE MODES**	**Notes**
Area 5 (Located in the Turbine Building) MSAREA501, 502, 503, 504	1.5 hrs	105 mi.	1, 2, 3	Assumes the trolley beam is installed in one of the four openings. Shield bolting is NOT required for tornado missile protection. Shields may be opened in modes 4, 5, & 6, or in modes 1, 2, & 3 with administrative controls in place.
Closure Resources Needed: JLG lift or equivalent, trolley beam rigging, hand tools, chain hoist, cutting torch, "com-a long" or equivalent, labor for trolley beam removal and shield closure. A Fire Protection Impairment Permit (FPIP) is required to open these shields.				
MISSILE SHIELD	**EST. CLOSURE TIME**	**WEATHER MONITORING DISTANCE**	**APPLICABLE MODES**	**Notes**
ESW Pumphouse Roof MSESWA or MSESWB	1 hr	70 mi	1, 2, 3, 4	Installation of hold down bolt nuts and washers ARE required for tornado missile protection Shields may be opened in modes 5 and 6, and modes 1, 2, 3, & 4 with administrative controls in place.
Closure Resources Needed: 3-ton crane and rigging, hand tools, crane operator, installation of rigging and installation of bolting				
MISSILE SHIELD	**EST. CLOSURE TIME**	**WEATHER MONITORING DISTANCE**	**APPLICABLE MODES**	**Notes**
ESW Manhole Covers MSMH01N or MSMH01S	1 hr	70 mi.	1, 2, 3, 4	Installation of hold down bolts and washers ARE required for tornado missile protection Shields required to be closed in modes 1, 2, 3, & 4. Shields may be opened in modes 5 & 6, and in modes 1, 2, 3, & 4 with administrative controls in place
Closure Resources Needed: 3-ton crane and rigging, hand tools, crane operator, installation of rigging and installation of bolting				

MISSILE SHIELD	EST. CLOSURE TIME	WEATHER MONITORING DISTANCE	APPLICABLE MODES	Notes
D/G Fuel Oil Tanks MSDGA or MSDGB	1 hr	70 mi.	ALL Modes	Not required for removal of small hatch on top Installation of hold down bolts and washers ARE required for tornado missile protection The diesel generators are not considered inoperable when the missile cover is removed from the emergency diesel fuel oil storage tanks so long as appropriate administrative controls are followed to ensure adequate missile protection is maintained. These controls include: limiting the time the cover may be removed to 36 consecutive hours, maintaining the cover rigged to the crane with personnel stationed to facilitate immediate replacement, and monitoring weather forecasts and local conditions to allow immediate replacement of the cover, if necessary.
Closure Resources Needed: 50-ton crane and rigging, hand tools, crane operator, installation of rigging and installation of bolting.				

MISSILE SHIELD	EST. CLOSURE TIME	WEATHER MONITORING DISTANCE	APPLICABLE MODES	Notes
RHR Heat Exchangers MSRHRA or MSRHRB	1 hr	70 mi.	All Modes	A Fire Protection Impairment Permit is required to open Shields do not use hold down bolting Shields required to be closed when: Modes 1, 2, & 3 – both trains operable Mode 4 – One train operable Mode 5 – One train operable with refueling pool full Mode 6 – One train operable with refueling pool full, or both trains operable with refueling pool less than full The shield protecting the inoperable or "stand-by" train in mode 4 & mode 6 with the refueling pool full may be opened, and the shields may be opened at other times with administrative controls in place
Closure Resources Needed: 12-ton crane and rigging, hand tools, crane operator an installation of rigging				