ACADIA POWER STATION

FREEZE PROTECTION PROCEDURE

Revision #	Reviewer's Initials	Approver's Initials	Approval Date
1	JGG		
2	BAP	BTU	2/7/17
3	JT		

FREEZE PROTECTION PROCEDURE

When freezing or below freezing conditions *(32°F or lower)* are expected for an extended period of time *(usually 2 or more days)*, operations takes necessary steps to ensure the stability of any running units and the protection of plant and necessary equipment from freezing conditions. This is done by utilizing a freeze protection checklist to ensure that all affected equipment is protected. Actions are taken within a reasonable timeframe before freezing conditions occur.

All heat tracing panels are inspected to ensure that they are powered up and functioning properly. The operations dept. will ensure that ammonia injection skid enclosures have fully fueled bullet heaters or electric heaters in place at each skid. All available bullet heaters are filled with fuel and placed in problem areas. The ammonia tanks shall be tarped with bullet heaters in place to prevent freezing of the ammonia system. All safety showers are to be cracked open to maintain a minimal flow. Service water drops throughout the plant are also cracked open.

During freezing weather conditions, equipment shall be monitored closely to detect early signs of freezing. Any transmitters that are found to be exposed shall be wrapped and insulated. Special attention should be given to exposed critical transmitters. These include, drum level and drum pressure transmitters on top of the HRSGs, kettle boiler level transmitters, and condenser overpressure protection transmitters. These have proved to be especially susceptible during previous freezing events.

Environmental emissions control and monitoring equipment shall be given first priority on operating units. Special attention shall be given to ammonia injection equipment to control NOx within permit limits and all NOx exceedances shall be minimized due to freezing equipment.

The operations dept. will verify that sufficient spare propane bottles are on hand in the event that transmitters/ lines need to be thawed with a torch. If the plant is not dispatched to run, any pumps that can be placed in operation are started to prevent freezing. If the equipment cannot be operated, it should be isolated and drained of any fluids that could freeze.

Once freezing conditions are no longer a threat, all isolated and/or drained equipment is placed back in its normal operational/stand-by mode.

FREEZE PROTECTION CHECKLIST

	Date	Time	Initials
Verify diesel for bullet heaters	_____	_____	_____
Verify that all bullet heaters are operational	_____	_____	_____
Verify that all heat tracing is operational	_____	_____	_____
Verify spare bottles for propane torch	_____	_____	_____
Place service air compressor cooler in service	_____	_____	_____
Place sample coolers in service	_____	_____	_____
Drain outdoor chemical tank sightglasses	_____	_____	_____
Shut water treatment doors when below 50°F	_____	_____	_____
Isolate & drain hotwell sightglasses	_____	_____	_____
Verify heaters at ammonia injection skids	_____	_____	_____
Crack open valves on service water system	_____	_____	_____
Crack open safety showers	_____	_____	_____
Run all condensate pumps and verify recirc flow	_____	_____	_____
Run all service water pumps or isolate & drain	_____	_____	_____
Run all demin make-up pumps or isolate & drain	_____	_____	_____
Open dome hood spray at least 5%	_____	_____	_____

FREEZE PROTECTION CHECKLIST (cont.)

	Date	Time	Initials
Crack open drain on air receiver tank	_____	_____	_____
Open air system valves hourly to remove water	_____	_____	_____
Monitor transmitters on T3K	_____	_____	_____
Open BFP warm-up lines	_____	_____	_____
Keep a BFP running with recirc at least 5% open	_____	_____	_____
HP/IP/LP drum LCV's open 5%	_____	_____	_____
Crack open hogger steam supply	_____	_____	_____
Crack open steam trap bypasses	_____	_____	_____
Crack drains on all drum sightglasses	_____	_____	_____
Ensure flow on all drum intermittent blowdowns	_____	_____	_____
Open HP/IP/LP drums continuous blowdowns 5%	_____	_____	_____
Open HP/IP/LP drums blowdown block valves	_____	_____	_____
Crack open drains on HP & IP superheater	_____	_____	_____
Open HP DSH block & control valves 5%	_____	_____	_____
Establish flow on deaerator warm-up line	_____	_____	_____
Fill chemical tanks with water and run pumps	_____	_____	_____

HEAT TRACING CHECKLIST

	Date	Time	Initials
FPP-11 (North of HRSG 11 kettle boiler)	_____	_____	_____
FPP-12 (SW of ST 13)	_____	_____	_____
FPP-13 (SW of ST 13)	_____	_____	_____
FPP-14 (North of HRSG 11 kettle boiler)	_____	_____	_____
FPP-23 (South of HRSG 24 near fuel gas htr)	_____	_____	_____
FPP-24 (North of CT 24 fuel gas htr)	_____	_____	_____
FPP-25 (South of CT 25 fuel gas htr)	_____	_____	_____
FPP-26 (NW of ST 26)	_____	_____	_____
CT-11 HTP-01 (South of CT 11 control oil skid)	_____	_____	_____
CT-12 HTP-01 (South of CT 12 control oil skid)	_____	_____	_____
CT-24 HTP-01 (South of CT 24 control oil skid)	_____	_____	_____
CT-25 HTP-01 (South of CT 25 control oil skid)	_____	_____	_____
010-ELB-PN-0003 (Cooling Tower MCC w wall)	_____	_____	_____

DOLET HILLS POWER STATION

FREEZE PROTECTION PROCEDURE

Dolet Hills

The Dolet Hills freeze protection plan is to ensure the integrity and functionality of the plants existing electrical heat tracing. To that end, the following steps are taken.

Annually, all of the plants electrical heat tracing circuits are functionally tested. A preplanned SAP PM is followed and any deficiencies are noted and repaired. See attachments "INSPECT PLANT AREA WIDE HEAT TRACING PM" and "INSPECT FREEZE PROTECTION ON CRITICAL LOOP INSTRUMENTATION".

When a cold weather event is expected where the temperature does not get above freezing for two days or longer, PM " INSPECT FREEZE PROTECTION ON CRITICAL LOOP INSTRUMENTATION" is repeated. During the event, attached spreadsheet "Critical Instrument Temps", is used to monitor and record critical instrument temperatures. Ambient temperature is also monitored and recorded in critical enclosures. 40 degrees F decreasing at any measurement point is considered an action point. During the recent cold weather event, critical temperature monitoring was increased due to the forecasted extreme low temperatures. A night shift was added and critical instrument temperature monitoring was increased to three times per shift, day and night shift.

A historical list of critical instruments that would have an immediate effect on the operation of the unit was distributed to personnel and monitored as follows:

Heat trace circuits were verified to be operating by measuring current at the breakers Transmitter enclosure temperature was read and recorded on a spreadsheet. Transmitter sensing line temperature was read and recorded in at least three places under the lagging next to the sensing line. All temperature readings listed above were taken every four hours around the clock. This was an increase from two times per shift, for our normal cold weather response, to three times per shift, due to the extreme nature of this event.
All temperature readings listed above were trended and any necessary action was taken if the temperature dropped to 40 degrees F.

A list of outlying buildings and enclosures was identified with equipment that was susceptible to freezing. In addition, a list of equipment that was not contained in an enclosure or building but was susceptible to freezing was identified.

These areas were protected as follows:

1. Portable heaters, gas or electric, were installed.
2. Temporary tarps were hung of wrapped around equipment.
3. Temporary scaffold enclosures were constructed with a roof or floor as necessary.
4. Additional insulation was added as necessary.

All of these enclosures and buildings internal temperatures were read and recorded every four hours around the clock.

All temperature readings were trended and any necessary action was taken if and when the temperature dropped to 40 degrees F.

INSPECT FREEZE PROTECTION ON CRITICAL LOOP INSTRUMENTATION.

VERIFY EACH HEAT TRACING CIRCUIT INDIVIDUALLY AS FOLLOWS:

1. Take an amp reading of each of each circuit at the source breaker and record.
2. Refer to heat trace drawings for breaker identification and location.
3. Take multiple temperature readings under the insulation lagging as necessary for the length of the heat trace. Record these readings.

Instrument:

- Drum Level A West
- Drum Level B West
- Drum Level A East
- Drum Level B East
- Drum Pressure West
- Drum Pressure East
- SH Attemperator Flow Primary
- SH Attemperator Flow Secondary
- Deaerator Level A
- Deaerator Level B
- Sootblower IR Flow
- Sootblower IK Flow
- Sootblower AH Flow
- Sootblower IR & IK Pressure
- Sootblower AH Pressure

NOTE ANY INSULATION THAT NEEDS REPAIRING ON LINES FOR PLANT INSULATOR

INSPECT PLANT AREA WIDE HEAT TRACING PM

VERIFY EACH HEAT TRACING CIRCUIT INDIVIDUALLY AS FOLLOWS:

1. Take an amp reading of each of each circuit at the source breaker and record.
2. Refer to heat trace drawings for breaker identification and location.
3. Take multiple temperature readings under the insulation lagging as necessary for the length of the heat trace. Record these readings.

LOCATION:

- COOLING TOWER
- BALL MILLS
- SO2 AREA/ INCLUDING CONVEYORS
- BOTTOM ASH AREA
- PULVERIZERS
- OIL SKIMMER PIT
- BOTTOM ASH RECIRC PUMPS
- SURGE POND/PRIMARY/AUXILIARY PONDS
- PLANT DISCHARGE PUMPS
- LIGNITE RUNOFF POND PUMPS AND PIPING
- METAL CLEANING WASTE POND PUMPS AND PIPING
- MAKE-UP POND PUMPS AND PIPING
- WASTE WATER SYSTEM: LOW PRIORITY

NOTE ANY INSULATION THAT NEEDS REPAIRING ON LINES FOR PLANT INSULATOR

Below is an outline of the measures that were taken in addition to our existing cold weather protection during the recent cold weather event.

A historical list of critical instruments that would have an immediate effect on the operation of the unit was distributed to personnel and monitored as follows;

- Heat trace circuits were verified to be operating by measuring current at the breakers
- Transmitter enclosure temperature was read and recorded on a spreadsheet
- Transmitter sensing line temperature was read and recorded in at least four places under the lagging next to the sensing line
- All temperature readings listed above were taken every four hours around the clock. This was an increase from two times per shift, for our normal cold weather response, to three times per shift, due to the extreme nature of this event.
- All temperature readings listed above were trended and any necessary action was taken if the temperature dropped to 40 degrees F

A list of outlying buildings and enclosures was identified with equipment that was susceptible to freezing. In addition, a list of equipment that was not contained in an enclosure or building but was susceptible to freezing was identified.

These areas were protected as follows;

- Portable heaters, gas or electric, were installed
- Temporary tarps were hung of wrapped around equipment
- Temporary scaffold enclosures were constructed with a roof or floor as necessary
- Additional insulation was added as necessary
- All of these enclosures and buildings internal temperatures were read and recorded every four hours around the clock
- All temperature readings were trended and any necessary action was taken if the temperature dropped to 40 degrees F

Critical Instrument Temps					
Critical Instrument	**Transmitter Enc.**	**Point A**	**Point B**	**Point C**	**Time**
	Degrees F				
Drum Level A West					
Drum LEVEL B West					
Drum Level A East					
Drum Level B East					
Drum Pressure West					
Drum Pressure East					
SH Attemp Flow Pri					
SH Attemp Flow Sec					
Dea Level A					
Dea Level B					
Soot Blower IR Flow					
Soot Blower IK Flow					
Soot Blower AH Flow					
Soot Blower IR & IK Press					
Soot Blower AH Press					

	Room Temp
Drum House West Amb	
Drum House East Amb	

Notes:

*Take readings every two hours and fill out sheet.
*Take readings through insulation next to sensing line in at least three places, Point A, B & C
*Ensure drum house temp stays above 32 degrees F.
*If any temp starts to drop near 35 degrees F, be proactive, add insulation heaters etc.
*Ensure all drum house doors stay closed.
*Make a PI screen that includes all of the above transmitters and monitor closely.
*If you can think of a critical instrument that is not on the list, add and monitor.

MADISON 3 POWER STATION

CLECO

FREEZE PROTECTION PROCEDURE

Madison 3 Material Handling Cold Weather Preparation

1. ***Check the following lights on the following equipment.***

   C/H Dust Collector, Cleaning Blower Transmitter up top.

   C/H Booster Pump inside building, keep tarp wrap around to hold heat.

   Silo Dust Collector, Cleaning Blower Transmitter up top.

   Tripper Deck Dust Collection Deluge Valve – By walkway to Elevator

   #8 Tripper Deck Fire Protection Deluge Valve – By the North door

   Open the low point drains (2) on the air side of #8 fire protection.

   Keep all doors closed on the building & electric cords run thru the wall, not in doorway.

2. ***Valve out the service water pipe that feeds #7 Conv. inside the deluge room*** & open the ball valves on top of #7 Conv. to drain piping. Run a hose from the ball valve connection by booster pump & out the building to drain the pipe, this prevents the water from freezing on the C/H concrete floor inside building.

3. ***Conveyor #1 Gearboxes Oil Circulating Pumps "A","B",and "C"*** need to be running in MANUAL when temperatures are under 40 degrees F. If the Conveyor is down for extended period of time during cold temperatures Heat Lamps with tarps or Kerosene Heaters will need to be in place on Gearboxes until operational temps are met.

4. ***Diverter Gate #4*** will need a Kerosene Heater in place if temperature stay freezing for extended periods if unloading L/S prior to switching to PetCoke. Damage to Actuator Arm will occur.

5. **Miscellaneous House Keeping.**

   All Wash Hoses will be disconnected and blew out with air. It is recommended that hoses be stretched out of the way along the Catwalk to drain accumulated moisture and eliminate tripping hazards.

   Kerosene Heaters need to be serviced and full of fuel.

   Additional tarps and Heat Lamps need to be secured along with extension cords.

Trouble areas need to be cleaned and clear of build up ahead of freezing temps. This includes the Head, Tail, and Take-Up areas of the conveyors along with structure where build-up could freeze and potentially damage Belts.

6. ***Check that the heater is turn on & thermostat is set inside crusher house deluge room and conveyor #4 deluge house.***

7. ***Drain all Fire Protection air piping from accumulated moisture.***
   The conveyors all have low point drains at the tail end, next to walkways.
   The conveyor take-up (#2, #3, #6) all have F/P pipes to drain on lower walkway.
   Crusher house building, #1 Conv. head end down the slope (2) & under the A&B drive motors. #1 Conv. tail section – 5 F/P drains, Air compressor drains (2), the supply air tank on the dock & any low point air piping can be blown out.

8. ***Check with Savage if temp is going to be below 30 F for several hours*** & if they are not running the wash down pump in the de-watering cell, a low point drain will have to be drained, to keep the dock header on north side from freezing. Blow all water hoses out with air. Drain barge dewatering pump and associated piping. Verify the heater is on in the fire protection building at the Dock.

9. ***While Unloading L/S Barges*** during the freezing temperatures Fuel Handlers need to be aware of ice buildup in the bottom of barges along with Ice Chucks throughout material. At times barges will be loaded at the Quarry during freezing weather that give us trouble at the Dock. Decision may be required to continue unloading is acceptable. **Barges may need to be set aside to THAW before damage to Conveyor and Unloading Equipment occurs.**

10. Crack both Lena water valves (2) on the main RR track crossing to allow water to flow thru valve, if temp is going to be below 30 F for very long.

11. ***Check that red lights are on the fire protection electrical boxes along #1 Conv. to dock***.

    Write a work request on any that are not working.

SAVAGE Old River Facility Freeze Protection Procedure

Water sources not Heat Traced will be left dripping.

Rock salt container will be stationed at the end of the graded cat walk.

Old River facility will also be implementing the buddy system on the dock. There will be always two team members always on dock during the freeze warning.

If ice is on the barge(s), the team members will not be walking on the barges until day light hours (when the ice melts).

MAD3 Cold Weather Preparation Guidelines

Close lids on the turbine deck accesses openings.

Turn off turbine building exhaust fans.

Hang tarps over the stationary louvers on the east side of the turbine building.

Check heat tracing PLC to make sure all heat tracing circuits are in auto.

Check for proper operation of permanent heaters in the turbine building, water plant, and drum houses.

Buy out a drum of kerosene from stores.

Hang tarps around boiler building fire pumps and stage a salamander heater.

Stage big electric heater by the transformer deluge header.

Check critical transmitter boxes to ensure heaters are operational.

Check boiler areas for insulation deficiencies in critical areas.

NESBITT 1 POWER STATION

CLECO

FREEZE PROTECTION PROCEDURE

On units 1, 2 and the water treatment building, prior to a cold weather event, we perform the following tasks:

Buy out a drum of kerosene from stores.

Water Plant

Verify heater operations in the building enclosures

Nesbitt 1

Check the proper operation of all heat trace circuits

Utilize tarps and heaters in areas of known issues from past cold weather events:
- Main Steam Flow Transmitters
- Feedwater Flow Transmitters
- Sootblowing Transmitters
- Air Heater Sootblowing Transmitters

Check for proper operation of permanent heaters in the turbine building, water plant, and drum houses.

In projected blow freezing events with Nesbitt 1 offline operations will place a fire in the boiler and heat it up to about 600 psi of drum pressure and then bottle up the boiler to protect it from extreme freeze damage that may result in extended start up durations or failed start up.

Rodemacher 2

Check the proper operation of all heat trace circuits

Utilize tarps and portable heaters in areas of known issues from past cold weather events:
- Bottom Ash supply controller
- Surge Tank
- Transfer Tank
- Byproduct Silo Mezz deck
- MATS air compressors

Check for proper operation of permanent heaters in the turbine building, water plant, and drum houses.

RODEMACHER 2 POWER STATION

CLECO

FREEZE PROTECTION PROCEDURE

Rodemacher 2 Material Handling Cold Weather Preparation:

1) Dumper electric room heat tracing cabinet has no number but there is a star (*) penciled in at the top of the cabinet. Breakers 20 & 22.

2) Dumper bathroom heater "on".

3) Dumper window spray header drained after each use. Close the supply valve in the bathroom, open the drain valve in the bathroom and open the spray header valve so the water will drain backwards.

4) Dumper electric room heating system "on".

5) Dust suppression system purged after each use. Open the manual air value at the sample house and the one in the dust suppression room. Turn on the pump switch in the control room. After ten minutes the purge should start and continue for 15 to 30 minutes. Observe that air is blowing through the spray nozzles. After the purge is complete, close the air valve at the sample house and in the dust suppression room. Turn the pump switch off so it won't spray if dumper is rotated for maintenance reasons.

6) Close all car dumper and electric room doors.

7) Blow all air header low point drains if extended freeze. Sodium system air dryer may need frequent blow down.

8) Drain any wash down lines and hoses used during the freeze after each use such as to wash down Conveyor "B" scale build up or the belt for sodium build up and etc.

9) Telescopic chute wash down line needs to be drained after each use of washing during freezing weather.

10) Insure all sample house doors remain closed after use.

11) Insure all tripper house doors and windows remain closed after use.

12) Blow out air valves along the conveyor and tunnel walkways *as rounds* are being made. Moisture builds up in the valves themselves and freezes which results in broken valves.

13) Insure heaters are working in deluge houses.

Coal Yard Shop

1) Move pressure washer inside shop
2) Drain outside water faucets
3) Move Water Truck inside shop
4) Drain low point on water tank by reclaim

5) Moisture traps drained on heavy equipment air brake system
6) Wall Heaters turned on in shop
7) Magnum water pump at landfill drained

TECHE POWER STATION /
ST. MARY'S CLEAN ENERGY CENTER

FREEZE PROTECTION PROCEDURE

Severe Weather Response Plan

Freeze Plan - General

Normal freeze periods experienced in this area are usually of minor significance and of short duration, causing no serious upset in plant operations. However, occasionally a severe freeze occurs, lasting for an extended time period, and deviation from normal operating procedures must be initiated to protect plant equipment. This is done to ensure the continuity of quality operation.

The characteristics of system load are such that normally several of the generating units are idle during the winter season. These idle units may be on “hot standby” for system purposes, on “cold standby”, or “unavailable” for maintenance work. Freeze safeguards instructions will vary, depending on the status of the units (idle or in service). Specific instructions are written for these many conditions. These should be followed as necessary.

There are two freeze categories Teche uses: moderate and severe. The primary differences between the two are as follows:

A moderate freeze is when the temperature drops to a reading of 28 to 30 degrees F for a short time period, but rises back above the freezing point.

A severe freeze is when the temperature drops below 28 degrees F for an extended time period, over ten (10) hours below 30° F.

An annual protection survey (SAP PM) of the freeze protective equipment will be done to ensure all equipment is in working condition for the winter season. The survey will consist of the following:

1. Check all boiler gauge glasses to determine if they are in working condition. Make repairs as necessary.
2. Check all de-aerator yarways to determine if they are in working condition. Ensure they are protected from freezing.
3. Check all permanent area heaters for proper operation. Make repairs as necessary.
4. Check insulation on transmitter lines, flow meter lines, etc., to ensure freeze protection and the insulation is water tight. Make repairs as necessary.
5. Make certain an adequate amount of tarpaulins are available for wind breaks.
6. Conduct a thorough inspection of all heat tracing to determine if circuits are operative. Make repairs as necessary.
7. Make certain an adequate supply of portable electric heaters, extension cords, and drip lights are available and the supply will last the winter months.

Severe Weather Response Plan
Moderate Freeze Conditions – Unit 1 Building

A. Miscellaneous

1. Close all windows and doors in Unit #1 turbine building.
2. Check permanent area heater to ensure it is on and working.
3. Monitor district water pressure/supply.

Severe Weather Response Plan
Freezing Conditions - Moderate Freeze Conditions – Unit 3 In Service

General -

1. When heating circuits are turned on at the switch panel (located inside #3 building by the battery room), this should turn on all of the heat tracing and heaters inside cabinets.
2. Turn on the fan inside the switch panel.
3. The condensate flow meter has a switch inside the cabinet that has to be in the “on” position and the extension cord has to be plugged in for the heat tracing on the condensate flow meter lines.
4. The spray flow meter cabinet heaters have to be turned on. (switches in cabinets)
5. Close water to all fire boxes and drain lines.
6. Protect fuel gas header transmitter from freezing.
7. Drain main power transformer coolers water header.
8. Close demineralizer water to battery room and drain line. (valve in water plant above MOPA tank)
9. Cover igniter header pressure regulator and install heater.

A. Boiler

1. Cover furnace pressure transmitter. (top burner deck on north side)
2. Cover igniter header pressure regulator.
   a. install heater or drop light
3. Plug in heat tracing at gas run. (behind fan room)
4. Cover openings in deareator house and install heater.

B. Service Water System

1. Cover strainer differential transmitter and block and install light.
2. Connect hose to check valve on down pump and run water through to create a flow.
   a. run hose to intake
3. Put screen wash pumps (2) on and tie to service water system. (to protect check valve)
4. Open by-pass for fire protection system.
5. Open equalizing valve on strainer.

C. Cooling Water System

1. Isolate and drain sight glass on storage tank.
2. Isolate and drain level alarms on storage tank.
3. Remove gauges from piping in fan room.

D. Instruments and Controls

Heat Tracing

I. Turn on heating circuits at heat tracing panel. (yellow switch) (panel by battery room)
2. Turn on fan at heat tracing panel.
3. Condensate flow meter - switch and plug-in in cabinet
4. Spray flow meters - switches in cabinets
5. Air heater oil piping - plug-in
6. Fuel gas transmitters - plug-in

E. Miscellaneous

1. Isolate and drain fire system piping to fire boxes. (valves are inside building)
2. Tie condensate tanks together. (open all valves)
3. Close demineralizer water to battery room and drain header. (valve above MOPA tank)
4. Isolate and drain piping to outside showers.
5. Cover well water sacrifice tank at water plant and install drop light.
6. Let faucet at #3 well water pump flow slowly.
7. Bleed water from control and service air systems.

A. Turbine Generator

1. Isolate and drain exciter coolers.
2. Isolate and drain hydrogen coolers.

B. Boiler

1. Boiler will have to be drained unless a fire can be kept in it to keep it from freezing.
2. Isolate and drain deaerator sight glass.
3. Isolate and drain drum sight glass.
4. Drain east and west drum level indicators.

C. Condenser

1. Isolate and drain sight glass.
2. Drain water from normal make-up meter.

D. Feed water System

1. On the seal drain tank, remove plugs on both sealing water pumps casings. (suction and discharge plugs)
2. Remove suction and discharge plugs on the auxiliary condensate pumps.
3. Open drain on sealing water to MDBFP and TDBFP.

E. Circulating Water System

1. Disconnect inlet and outlet gauges at condenser.
2. Drain water boxes.

F. Service Water System

1. If discharge valves are closed on pumps the check valves plugs must be removed to drain water from between check and discharge valves.
2. Discharge vents on pumps should stay open.
3. Disconnect differential gauges at strainer.
   a. drain lines

G. Cooling Water System

1. Drain cooling water header in fan room.
2. Isolate and drain sight glass and level alarms on cooling water tank.

H. Instruments and Controls

1. Turn on heat tracing circuits at heat tracing panel. (yellow switch) (by battery room)
2. Turn on fan on heat tracing panel.
3. Turn on condensate flow meter heating. (switch and plug-in in cabinet)
4. Turn on spray flow meters heating. (switches in cabinets)

5. Turn on air heater oil piping heating. (plug-in)
6. Turn on fuel gas transmitters heating. (plug-in)
7. Turn on igniter header regulator heating. (drop light)

Disconnect and drain the following transmitters:

1. feed water to economizer pressure - inside building -
2. reheat flow - inside building -
3. MDBFP recirc pressure - inside building -
4. feed water flow - inside building -
5. high pressure steam to TDBFP - inside building -
6. feed water pressure - inside building -
7. feed water flow switch to MDBFP recirc regulator - inside building-
8. throttle pressure - inside building -
9. feed water pressure gauge - inside building -
10. Hot reheat at turbine pressure
11. TDBFP recirc pressure gauge - inside building -
12. feed water flow switch to TDBFP recirc regulator - inside building -
13. feed water flow from TDBFP - inside building -
14. feed water pressure to reheat attemperator TDBFP - inside building -
15. service water pressure - inside building -
16. TDBFP de-aerator IP-2 extraction pressure - inside building -
17. first stage shell pressure - inside building -
18. impulse pressure - inside building -
19. throttle pressure - inside building -
20. ip turbine exhaust pressure - inside building -
21. turbine chest pressure - inside building -
22. circulating water inlet pressure - inside building -
23. 3-1 heater drain flow - inside building -
24. condensate flow - inside building -
25. condensate discharge pressure - inside building -
26. closed cooling water header pressure - inside building –
27. fire protection header - inside building
28. deaerator level - on boiler -
29. drum level - on boiler –

I. Miscellaneous

1. Isolate fire boxes and drain headers.

2. Ensure all heaters inside buildings are on and working.
3. Isolate and drain header for demineralized water to battery room.

SMCEC

Severe Weather Response Plan

Freeze Plan - General

Normal freeze periods experienced in this area are usually of minor significance and of short duration, causing no serious upset in plant operations. However, occasionally a severe freeze occurs, lasting for an extended time period, and deviation from normal operating procedures must be initiated to protect plant equipment. This is done to ensure the continuity of quality operation.

The characteristics of system load are such that normally several of the generating units are idle during the winter season. These idle units may be on “hot standby” for system purposes, on “cold standby”, or “unavailable” for maintenance work. Freeze safeguards instructions will vary, depending on the status of the units (idle or in service). Specific instructions are written for these many conditions. These should be followed as necessary.

There are two freeze categories St Mary uses: moderate and severe. The primary differences between the two are as follows:

A moderate freeze is when the temperature drops to a reading of 28 to 30 degrees F for a short time period, but rises back above the freezing point.

A severe freeze is when the temperature drops below 28 degrees F for an extended time period, over ten (10) hours below 30° F. If unit is offline, low point drains and sight glasses need to be drained.

An annual protection survey (SAP PM) of the freeze protective equipment will be done to ensure all equipment is in working condition for the winter season. The survey will consist of the following:

1. Check all gauge glasses to determine if they are in working condition.
   Make repairs as necessary.
2. Check all deaerator yarways to determine if they are in working condition.
   Ensure they are protected from freezing.
3. Check all permanent area heaters for proper operation. Make repairs as necessary.
4. Check insulation on transmitter lines, flow meter lines, etc., to ensure freeze protection and the insulation is water tight. Make repairs as necessary.
5. Make certain an adequate amount of tarpaulins are available for wind breaks.

6. Conduct a thorough inspection of all heat tracing to determine if circuits are operative. Make repairs as necessary.
7. Make certain an adequate supply of portable electric heaters, extension cords, and drip lights are available and the supply will last the winter months.

Teche Power Station

Prior to the winter season, PM's were generated to verify heat tracing circuits were tested for proper operation. Preceding the freezing temperatures for the week in question, all heat tracing was turned on and once again verified to be working. The operations department used check lists to make sure nothing was missed.

BRAME ENERGY CENTER

FREEZE PROTECTION PROCEDURE

All Units:

Utility group ensures that a full drum of kerosene is in oil storage
Check kerosene heaters are in working order, if not purchase new ones from stores
Stage 480V stand up heaters as requested by operations
Check and verify turbine deck access covers are closed all units

Nesbitt 1 and Rodemacher 2:

PM Work Orders

Unit 1 – Crib House Freeze Protection Inspection
Unit 1 – Water Plant Freeze Protection Inspection
Unit 1 – Boiler Freeze Protection Inspection
Unit 1 – Check Drum House vent fan and heater

Unit 2 – Instrument Enclosure Freeze Protection Inspection
Unit 2 – Crib House Freeze Protection Inspection
Unit 2 – Boiler Freeze Protection Inspection
Unit 2 – Unit Freeze Protection Heater Inspection
Unit 2 – Check Drum House vent fan and heater

Madison 3:

Check heat tracing PLC to make sure all heat tracing circuits are in auto.
Verify the heat tracing for the baghouse inlet transmitters for both boilers is energized.
Verify that the level transmitters for the cooling water tanks are energized.
Verify the steam flow transmitter enclosures (located on feeder deck) are energized.
Verify the closed cooling level transmitters on top of the pipe rack are energized.
Verify the engine block heaters on the emergency generator and the diesel fire pump are operating.

Brame Energy Center

The operations group for all three generating units (Nesbit 1; Rodemacher 2; and Madison 3):

1. verify the operation of all heat trace panels and circuits;
2. insure insulation integrity in critical areas;
3. stage portable heaters and tarps;
4. stage fueling for the portable heaters;
5. verify operation of all permanently installed heaters in the turbine buildings, water plant, and drum and dearator enclosures; and
6. procure hand held heating devices and fuel source from internal stores.

The material handling group members for Rodemacher 2 and Madison 3:

1. verify the operation of all heat trace panels and circuits;
2. insure that all doors and windows are closed in all conveyor control rooms, tripper deck level enclosures, railcar dumper building and sample and transfer house enclosures;
3. verify operation of all permanently installed heaters in buildings and enclosures;
4. purge all dust suppression systems with plant air;
5. stage portable heaters and tarps along with fuel for the heaters; and
6. verify that all fuel storage tanks are full prior the any cold weather event.

The maintenance group members:

1. aid the operations and material handling groups in constructing temporary enclosures;
2. staging portable heaters, tarps and fuel for the heaters; and
3. preventive maintenance work orders are generated prior to the winter season for maintenance to verify all heat trace systems, transmitter enclosure heaters, permanently installed building and enclosure heaters and operation of all portable heaters.

Operations shift and maintenance supervisors verify that all tasks are completed prior to any cold weather event.

COUGHLIN POWER STATION

FREEZE PROTECTION PROCEDURE

Coughlin Power Station

Coughlin has a written Freeze Protection procedure/checklist that is initially implemented at the onset of cold weather and reviewed immediately prior to expected freezing weather events. This procedure/ checklist outlines operational measures to be taken (depending on unit/equipment status) heat trace systems to be energized, temporary windbreak structures to be erected, temporary heater placement, etc. In addition to the written plan, staffing levels are reviewed and enhanced when deemed necessary to support the potential for cold weather related issues and poor travel conditions. Due to the anticipated extreme nature of this event, additional operations and maintenance personnel were housed on-site to support the facility on a 24-hour basis.

The measures outlined in the Coughlin Power Station Freeze Protection procedure/checklist were reviewed/implemented as appropriate, based on unit/equipment status, prior to the onset of freezing conditions for this event. Plant management met with operations and maintenance personnel on multiple occasions during the preceding week to confirm completion and to discuss potential enhancements to the plan based on the predicted extreme cold.

FREEZE PROTECTION

DESCRIPTION	Unit 6 Date/Initials	Unit 7 Date/Initials	Unit 7-1 Date/Initials	Unit 7-2 Date/Initials	Return to Normal
CTS					
TURBINE ENLOSURES					
Vent Fans Off and Doors Closed					
WATER WASH SKIDS					
Freeze Protection PM Completed					
Tank Fill Booster Pump Drained / Protected					
EVAPORATIVE COOLERS					
Pump Plugs Removed and Drained					
Evap Inlet Headers & Oil Cooler Spray Headers Drained					
Pall Filter Drained to Top of Filters					
UNIT 6 & 7					
CRIB HOUSES *(CWP Not Running)*					
Strainer and Spray Header Drained					
Bearing Water Valves Open for Flow					
CRIB HOUSES *(CWP Running)*					
Screens Running in Hand					
Spray Regulators Blocked Open					
Control Air Low Point Drains Bleeding					
Check Bearing Water Heat Trace Operation					
HP BFPS UNIT 7 *(Not Running)*					
Seal Water Supply Isolated at Header and Strainers Drained					
VACUUM PUMPS					
Drain Pumps					
Drain Seal Water Tanks and Isolate Seal Water Supply					
DEAERATORS					
Sight Glasses Isolated and Drained					
Heat Trace Breakers On					
STEAM TURBINE LUBE OIL UNIT 6					
Cooling Water Valved Out					

FREEZE PROTECTION

DESCRIPTION	Unit 6 Date/Initials	Unit 7 Date/Initials	Unit 7-1 Date/Initials	Unit 7-2 Date/Initials	Return to Normal
Auxiliary Oil Pump on 6 and 7					
GENERATOR H2 COOLERS					
Crack TCV's					
AMMONIA TANK VAPORIZERS					
On and Operating					
HRSG SAMPLE ANALYSIS					
Run Secondary (Chilled Water) Pump in Hand					
Heaters on in Sample Analysis Buildings					

FREEZE PROTECTION

DESCRIPTION	Unit 6 Date/Initials	Unit 7 Date/Initials	Unit 7-1 Date/Initials	Unit 7-2 Date/Initials	Return to Normal
HEAT TRACE PANELS (9)					
Water Plant - Breaker Room Panel WP-1					
Unit 6 Heater Cab #24 (South of Elevator)					
Unit 7 Heat Trace Cab					
7-1/7-2/6 HRSG Cabinets					
7-1/7-2/6 Panel 700					
UNIT 7 ROLL UP DOORS					
Close East Vacuum Pump Doors					
Close West 7-1 Air Compressor Door					
Close South Big Blue Air Compressor Door					
Close West 7-2 Air Compressor Door					
Install Pre-fab Door North of 7 HP BFP Motor					
6-1 AND AIR COMPRESSOR					
Running					
6 COOLING WATER PUMP					
Isolate and Drain Pump					
Isolate and Drain Twin Strainers and Bypass Strainer					
COMMON FACILITY					
SERVICE WATER COOLERS					
Throttle Cooler Outlets (Cooling Water Side)					
FIRE PUMP					
Establish Flow					
Block Heater On					
Drip on Fire Header Discharge to Flume					
ALL SERVICE WATER PUMPS ON					
Boiler Fill Pump					
Isolate and Remove Drain Plugs From Pump					
ALL SMALL FIRE PROTECTION BOXES					
Hoses Disconnected and Dripping					

FREEZE PROTECTION

DESCRIPTION	Unit 6 Date/Initials	Unit 7 Date/Initials	Unit 7-1 Date/Initials	Unit 7-2 Date/Initials	Return to Normal
SANITARY WASTE					
Valved Out and Drain Service Water Supply / Open Valve At Sewer Plant					
AIR RECEIVER TANKS					
Unit 6 - All 4 Tank Manual Blowdowns Cracked Open					
Unit 7 - Both Tank Traps Blowdowns Cracked Open					
HEATER PLACEMENTS/ TEMPORARY WIND BREAK WALLS					
6 MPT Deluge House					
6 Seal Oil Skid					
By Service Water Pumps					
Between 6 Condensate Pumps					
By 6-1 Air Dryer					
By 6-2 Air Dryer					
6 Deaerator Level Transmitter House					
7 Deaerator Level Transmitter House					
6 Vacuum Pumps					
6 Hotwell Level Transmitters					
7 Condensate Tank House					
By 6 Cooling Water Pump					
Open Loop Service Water Tank Level Transmitter					
Closed Loop Service Water Tank Level Transmitter					
Demineralizer Suction Tank Transmitter House					
6 Crane Bay					
6 Vacuum Pumps					
6 Seal Oil Skid and Bus Duct					
6-1 Air Dryer					
6-2 Air Dryer					
U7 and U6 IP Boiler FW pumps					
7-1 Reheat and S/H Transmitters					
All 3 CT fuel gas heaters					

FREEZE PROTECTION

DESCRIPTION	Unit 6 Date/Initials	Unit 7 Date/Initials	Unit 7-1 Date/Initials	Unit 7-2 Date/Initials	Return to Normal
All 3 Ammonia Dilution Skids					
7-2 Instrument Air compressor					
All 3 CT Instrument Air Compressor					
All 3 CT Lube oil Temperature control valve					

FREEZE PROTECTION

DESCRIPTION	Unit 6 Date/Initials	Unit 7 Date/Initials	Unit 7-1 Date/Initials	Unit 7-2 Date/Initials	Return to Normal
PLUG IN HEAT TRACES					
Fire Protection Header to Cooling Water / Small Fire Boxes Isolation Valves					
Water Well Booster Pumps					
Pull Plugs and Drain					