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UNIT 1 SHUTDOWN TO HOT STANDBY CONDITION

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I. OBJECTIVE

To shut down Unit 1 from full load or any intermediate load to a hot standby condition of the primary plant and secondary plant to a generator-off-the-line, full vacuum, steam dump control of main steam at 930 psig condition.

II. CONDITIONS

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EDM-SITE

- A. Unit 1 is on the line at any electrical load.
- B. The nuclear instrumentation: startup, intermediate, and power channels shall be operating normally or in a ready-to-operate condition.
- C. Auxiliary systems are in service as required for hot standby conditions.

III. PRECAUTIONS

- A. Any plant changes which produce a sudden change in reactor coolant temperature of the order of 10°F or in reactor coolant boron concentration of the order of 10 ppm must be avoided.
- B. Xenon level variations must be anticipated following a load decrease and boron concentration changes made as required to maintain the control group in the normal operating band.
- C. Whenever reactor power is greater than or equal to 10% full power, three (3) reactor coolant pumps shall be in operation. Whenever reactor power is less than 10% of full power, operation with less than three (3) reactor coolant pumps operating shall be limited to less than 24 hours; except during low power physics testing. (Conducted below 5% of full power.)
- D. The steam generator water levels should be manually controlled when in the hot standby condition and maintained at 50% level as indicated on the narrow range recorders to prevent the feedrings from being uncovered.
- E. Failure to place the feedwater controls on manual prior to tripping the turbine stop valves may result in a large volume of feedwater being added to the steam generators. This could result in cooldown of the reactor coolant.
- F. Isotopic analysis for iodine in the reactor coolant must be made between 2 and 6 hours following a thermal power change exceeding 15% within a one hour period.

IV. CHECK-OFF LIST (Not Applicable)

V. INSTRUCTIONS

IMPORTANT STEPS

KEY POINTS

- | | |
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| <ul style="list-style-type: none">1. Inform System Dispatcher and Switching Center the unit is ready to reduce load, estimated time of going off the line, and the rate of load reduction. | <ul style="list-style-type: none">1. The Dispatcher and Switching Center should be informed as far in advance as practicable when preparing to take the unit off the line. |
|--|--|

CHECK APPLICABLE CONCERNING
STICK FILE FOR CURRENT INFORMATION

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IMPORTANT STEPS

2. Reduce load on the unit.
3. On load reduction, observe alarms and recorder indications.
4. At less than 70% load, remove reheater steam dump system from service.
5. Remove flash evaporators from service.
6. Borate as necessary to keep control rods above shutdown margin.
7. Unit at 33% of full load.
8. Unit at 20% of full load.
 - a.

KEY POINTS

2.
 - a. Mark charts as per O.I. S-12-11.
3.
 - a. Alarm "Alert-Switch NIS Mode of Operation to Mid-Range".
 - b. Change mode of operation switch from High to Mid.
4. See Operation Instruction S-9-2.
5. Refer to O.I. S-2-5.
7.
 - a. Observe operation of reheater controls.
 - b. 125°F/hr. maximum rate of temperature change on cross-over
8.
 - a. (1) Transfer reactor over-power mode of operation from Mid to low position.
 - (2) Transfer rod control from automatic to manual.
 - (3) Transfer feedwater to manual control and slowly increase level to 50% as indicated on the narrow range recorders.
 - (4) Transfer steam dump mode switch from automatic to pressure control at 930 psig set point.

IMPORTANT STEPS

8. (continued)
 - b. Transfer 4160 volt bus 1A and 1B from the unit auxiliary transformers to station auxiliary buses 1C and 2C (refer to O.I. S-6-5).
 - c. Stop heater drain pumps
9. Reduce unit load to minimum on load limit.
10. Below 10% of full load, reduce feedwater pump and condensate pump requirements
11. Start turbine auxiliary oil pump.
12. Notify Dispatcher and Switching Center that unit is ready to take off the line.

KEY POINTS

8. (continued)
 - a. (5) Open turbine drain valves and extraction trap bypasses.
 - b. (1) If the 220 kv and 138kv switchyards are connected, transfer by parallel operation.
(2) If the 220kv and 138kv switchyards are not interconnected, transfer by drop and pickup operation.
9.
 - a. Under manual control, insert control rods to maintain avg Tavg between 535° and 540°F.
 - b. Verify that steam dump or pressure control is regulating for a stable reactor power level.
10. Stop a feedwater pump and a condensate pump.
12.
 - a. The Dispatcher and Switching Center should be informed of status of unit. The Dispatcher gives permission to take unit off the system.
 - b. Take the power system stabilizer and voltage regulator out of service.

IMPORTANT STEPS

KEY POINTS

12. (continued)

12. (continued)

- c. If turbine tests are planned, remove unit from line by opening unit PCB's.
- d. If no tests are planned, reduce steam flow to zero and allow unit to be removed from service by no-load and anti-motoring circuits.

13. Turbine-generator on turning gear.

13.

- a. Verify unit automatically on turning gear, and field breaker open.
- b. Lube oil cooling set points changed from 115°F to 85°F.
- c. Turbine hood sprays on temperature control.

14. Complete switching to provide an alternate source of auxiliary electrical power.

14.

- a. Notify Switching Center of switching procedure.
- b. Check open Unit 1 PCB's and 4160V ACB's 11A04 and 11B04.
- c. Open the generator motor operated disconnect.
- d. Close unit PCB's

15. Maintain reactor nuclear power level <10% of full load power.

15.

- a. Adjust reactor makeup control to automatic at reactor coolant boron concentration for leakage requirements.
- b. Periodically initiate pressurizer spray flow to adjust boron concentration.

* 16. Reduce primary and secondary plant auxiliary requirements.

a. Mark charts as per O.I.S-12-11.

VI. FINAL CONDITIONS

The final conditions of hot standby are:

- A. The reactor power level is being maintained by manual control of the controlling group of rods at <10% of full power by observing the nuclear intermediate channels and maintaining Tavg between 525° - 540°F. The pressure control of the main coolant will be automatically controlled and maintained at 2085 psig.
- B. Secondary plant (turbine-generator and auxiliaries) is in a hot standby condition with the unit on turning gear, steam seals on, normal vacuum, steam generator levels manually controlled at 50%, and a minimum number of auxiliaries in operation. An alternate source of auxiliary electrical power is available.

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SUPERINTENDENT UNIT 1

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*Indicates revision