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NUCLEAR POWER GENERATION DIVISION

TECHNICAL DOCUMENT

EMERGENCY OPERATING SPECIFICATION

69 - 1001168 - 01

Doc. ID - Serial No., Revision No.

for

LOSS OF REACTOR COOLANT/REACTOR

COOLANT SYSTEM PRESSURE

EOS 0162

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RECORD OF REVISION

NUMBER

69-1001168-01

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1.0 PURPOSE

This specification describes the recommended actions in the event of an abnormal decrease in Reactor Coolant System (RCS) pressure or pressurizer level. The symptoms and actions are considered according to the severity of the accident.

1.1 Small leak - within the capability of one makeup pump to maintain RCS pressure.

1.2 Intermediate leak - within the capability of the High Pressure Injection (HPI) System to maintain RCS pressure.

1.3 Large leak - exceeds the capability of the HPI system to maintain RCS pressure.

2.0 SYMPTOMS

2.1 Small Leak

2.1.1 Makeup tank inventory decreasing during steady state operation greater than the normal rate but less than the capacity of one makeup pump.

2.1.2 Makeup flow increasing with stable T_{ave} .

2.1.3 Possible radiation alarm in reactor building (RB) or other location that could indicate a RCS leak.

2.1.4 Possible RB sump level increase.

2.1.5 Greater than normal leakage during the routine performance of Reference 6.2.

2.2 Intermediate Leak

2.2.1 Pressurizer level and RCS pressure decreasing with stable T_{ave} and makeup flow increasing to maximum.

2.2.2 Makeup tank inventory decreasing greater than capacity of one makeup pump but less than capacity of HPI system.

2.2.3 Radiation alarm in RB or other location that could indicate a RCS leak.

2.2.4 Increasing level in RB sump with possible high level alarm.

2.2.5 Possible increase in RB pressure and temperature.

2.2.6 Possible makeup flow high alarm.

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TECHNICAL DOCUMENT2.3 Large Leak

- 2.3.1 Rapid decrease in pressurizer level and RCS pressure.
- 2.3.2 Reactor and turbine trips accompanied by Engineered Safety Features Actuation System (ESFAS) actuation.
- 2.3.3 High radiation alarm in RB or other location that could indicate a RCS leak.
- 2.3.4 High reactor building pressure and temperature.
- 2.3.5 High RB sump level with a high level alarm. (01)

3.0 AUTOMATIC ACTION3.1 Small Leak

Flow increases through pressurizer level control valve.

3.2 Intermediate Leak

- 3.2.1 Flow increases through pressurizer level control valve. (01)
- 3.2.2 Possible reactor trip (Low RCS pressure or low pressurizer level). (01)
- 3.2.3 Possible turbine trip. (01)
- 3.2.4 Possible ESFAS actuation (Low RCS pressure). (01)

3.3 Large Leak

- 3.3.1 Reactor trip (Low RCS pressure or low pressurizer level)
- 3.3.2 Turbine trip
- 3.3.3 ESFAS Actuation (Low RCS pressure)

4.0 IMMEDIATE OPERATOR ACTION4.1 Small Leak

- 4.1.1 Isolate letdown
- 4.1.2 Attempt to locate and isolate the leak

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4.2 Intermediate Leak

4.2.1 Trip reactor and assure turbine trips

4.2.2 Isolate letdown

4.2.3 Initiate HPI

4.3 Large Leak

4.3.1 Verify automatic action has taken place.

4.3.2 Deleted.

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4.3.3 Trip all RC pumps if adequate suction pressure cannot be maintained.

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5.0 SUBSEQUENT OPERATOR ACTION

If a steam generator (SG) tube leak is suspected as the casualty (radiation in secondary steam system or other indication) when RC pressure has been reduced below secondary safety valve setpoint, isolate the affected SG and use remaining SG for cooldown as required. Additional measures to reduce secondary system contamination and to reduce or prevent the release of radioactive elements to the atmosphere should be taken.

(01)

5.1 Small Leak

(01)

5.1.1 If leakage cannot be reduced to less than the limits of Reference 6.1 follow the actions required by Reference 6.1.

5.1.2 Maintain makeup tank level per Reference 6.3.

5.1.3 Terminate RB purge if in progress.

5.2 Intermediate Leak

(01)

5.2.1 Operate third makeup pump to aid HPI as needed to maintain pressurizer level.

NOTE: It will be necessary to take water from the makeup tank periodically to prevent overfilling due to the return flow from RC pump seals.

5.2.2 Reduce the number of operating RC pumps to one in each loop.

5.2.3 Terminate RB purge if in progress.

5.2.4 Cooldown the plant to cold shutdown.

5.2.5 Attempt to find and isolate the leak.

5.2.6 Prior to running out of water for HPI, or if HPI flow is below 900 GPM and pressure is above the maximum allowed for the Decay Heat Removal System (DHRS), use the DHR pump to transfer water from the RB sump to HPI per References 6.3 and 6.8.

5.2.7 When RCS pressure allows, use DHR system in the RB sump recirculation mode per Reference 6.8.

NOTE: Insure refill and repressurization of the RCS does not cause dead head of DHR pumps.

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5.3 Large Leak

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- 5.3.1 Verify proper operation of ESFAS, including initiation of low pressure injection when the setpoint is reached per Reference 6.4.
- 5.3.2 Cooldown the plant in as near normal a manner as possible per Reference 6.6.
- 5.3.3 While still using water from the borated water storage tank (BWST), assure adequate fluid supply to the high or low pressure injection systems will be available from the RB sump prior to the BWST low level alarm per Reference 6.8.
- 5.3.4 Establish normal or RB sump recirculation decay heat removal as appropriate when the BWST low level alarm setpoint is reached per Reference 6.8.
- 5.3.5 Sample RB hydrogen and initiate hydrogen removal procedures if required.
- 5.3.6 Secure ESFAS components as necessary.

NOTE: HPI may only be secured if the following conditions are met.

- (1) The low pressure injection system is in operation and the flow is equal to or greater than that required to remove the decay heat load or
 - (2) HPI has been in operation for greater than 10 minutes, the pressurizer level is above the normal operating level and the system pressure is at least 50 PSIG (plus instrument error) above saturation pressure for the reactor outlet water temperature.
- 5.3.7 Initiate long term cooling with the decay heat removal system per References 6.4 and 6.8.

6.0 REFERENCES

- 6.1 Plant Technical Specifications
- 6.2 RCS Leak Detection, OS 5021
- 6.3 Makeup and Purification System Operation, OS 3521

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- 6.4 ESFAS Operation, OS 2621
- 6.5 Reactor Trip, EOS 0172
- 6.6 Plant Shut-down, OS 0135
- 6.7 Plant Limits and Precautions, OS 1101
- 6.8 Decay Heat Removal System Operation, OS 3621

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