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3.7 PLANT SYSTEMS

3.7.6 Upper Surge Tank (UST) and Hotwell (HW)

LCO 3.7.6 The UST and HW shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Requirements of the LCO not met.	A.1	Be in MODE 3.	12 hours
	AND		
	A.2	Be in MODE 4 without reliance on steam generator for heat removal.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify combined inventory in the UST and HW is ≥ 155,000 gal. AND Inventory in the UST is ≥ 30,000 gal.	12 hours

B 3.7 PLANT SYSTEMS

B 3.7.6 Upper Surge Tank (UST) and Hotwell (HW)

BASES

BACKGROUND

The UST and HW provide a source of water to the steam generators for removing decay and sensible heat from the Reactor Coolant System (RCS). The UST and HW provide a passive flow of water to the Emergency Feedwater (EFW) System (LCO 3.7.5, "Emergency Feedwater (EFW) System"). For accident mitigation, heat removal is assumed to be through steam released to the atmosphere by the main steam safety valves and the atmospheric dump valves. However, the most likely steam flow path is to the condenser and hotwell by the non-safety grade path of the turbine bypass valves.

The emergency feedwater pumps are normally aligned to the upper surge tanks (UST). The UST provides the initial source of water for the EFW System. When that supply is exhausted, the pumps may be aligned to draw water from the hotwell. A minimum level of 6 feet (at least 30,000 gallons) is maintained in the UST to assure an adequate source of water to the EFW until other sources can be aligned. This minimum level of 6 feet includes an allowance for instrument uncertainty and depletion of inventory while transferring the EFW suction to an alternative source of water.

The UST and the piping connecting them to the EFW pumps has been analyzed and qualified to withstand a design basis seismic event. This includes piping up to the first normally closed valve. The hotwell and connected piping used for the TDEFW pump suction supply has been evaluated using a "seismic experience" approach and found capable of withstanding a seismic event. Although the evaluation methodology is not recognized for licensing basis, this secondary water supply is considered to be a "seismic assured source of water." Feedwater is also available from alternate source(s).

A description of the condensate/feedwater reserves available to the EFW System is found in the UFSAR, Section 10.4, (Ref. 1).

BASES (continued)

APPLICABLE SAFETY ANALYSES

The UST and HW provide cooling water to remove decay heat following events in the accident analysis, as discussed in the UFSAR, Chapters 10 and 15 (Refs. 2 and 3, respectively).

The required inventory in the UST and HW is based on maintaining hot standby conditions for one hour, followed by a 50°F per hour cooldown to decay heat removal entry conditions. Although the EFW system capacity is sufficient to support a 50°F per hour cooldown rate, this rate is not achievable during certain events, such as a natural circulation cooldown.

The UST and HW satisfy Criteria 2 and 3 of 10 CFR 50.36 (Ref. 4).

LCO

To satisfy LCO requirements, the UST and HW must contain the specified volume of water available to the EFW System.

The OPERABILITY of UST and HW is determined by maintaining the tank volume at or above the minimum required volume.

APPLICABILITY

In MODES 1, 2, 3, and in MODE 4, when steam generator is being relied upon for heat removal, the UST and HW are required to be OPERABLE.

In MODES 5 and 6, the UST and HW are not required because the EFW System is not required.

ACTIONS

A.1 and A.2

If the requirements of the LCO are not met, the unit must be placed in a MODE in which the LCO does not apply, with the DHR System in operation. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours, and in MODE 4, without reliance on steam generators for heat removal, within 24 hours. This allows an additional 6 hours for the DHR System to be placed in service after entering MODE 4.

BASES

ACTIONS

A.1 and A.2 (continued)

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

This SR verifies that the UST and HW contain the required volume of cooling water. The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the UST and HW inventory between checks. The 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms to alert the operator to abnormal deviations in UST and HW levels.

REFERENCES

1. UFSAR, Section 10.4.
2. UFSAR, Chapter 10.
3. UFSAR, Chapter 15.
4. 10 CFR 50.36.