

2.0 LIMITING CONDITIONS FOR OPERATION

2.5 Steam and Feedwater Systems

Applicability

When steam generators are relied upon for reactor coolant system heat removal.

NOTE:

When heating the reactor coolant above 300°F the steam driven auxiliary feedwater (AFW) pump is only required to be OPERABLE prior to making the reactor critical.

Objective

To define certain conditions for the steam and feedwater system necessary to assure adequate decay heat removal.

Specifications

- (1) Two AFW trains shall be OPERABLE when T_{cold} is above 300°F.
 - A. With one steam supply to the turbine driven AFW pump inoperable, restore the steam supply to OPERABLE status within 7 days and within 8 days from discovery of failure to meet the LCO.
 - B. With one AFW train inoperable for reasons other than condition A, restore the AFW train to OPERABLE status within 24 hours.
 - C. If the required action and associated completion times of condition A or B are not met, then the unit shall be placed in MODE 2 in 6 hours, in MODE 3 in the next 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.
 - D. With both AFW trains inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specification (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.
- (2) The motor driven train is required to be OPERABLE when T_{cold} is below 300°F and the steam generators are relied upon for heat removal. With the motor driven AFW train inoperable, then initiate actions to restore one AFW train to OPERABLE status immediately. Technical Specification (TS) 2.0.1 and all TS actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.
- (3) A minimum of 55,000 gallons of water in the emergency feedwater storage tank (EFWST) and a backup water supply to the emergency feedwater storage tank shall be available. With the EFWST inoperable, verify operability of the backup water supply within four hours and once per 12 hours thereafter, and restore the EFWST

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to OPERABLE status within 24 hours. If these action requirements cannot be satisfied, then the unit shall be placed in at least MODE 3 within 6 hours, and less than 300°F without reliance on the steam generators for decay heat removal within the next 18 hours.

- (4) The main steam stop valves are OPERABLE when T_{cold} is above 300°F and capable of closing in four seconds or less under no-flow conditions.

Basis

A reactor shutdown from power requires a removal of core decay heat. Immediate decay heat removal requirements are normally satisfied by the steam bypass to the condenser. Therefore, core decay heat can be continuously dissipated via the steam bypass to the condenser as long as feedwater to the steam generator is available. Normally, the capability to supply feedwater to the steam generators is provided by operation of the turbine cycle feedwater system. In the unlikely event of complete loss of electrical power to the station, decay heat removal is by steam discharge to the atmosphere via the main steam safety and atmospheric dump valves. Either auxiliary feed pump can supply sufficient feedwater for removal of decay heat from the plant. Technical Specification 2.1.1 establishes when the steam generators are required for heat removal. Each train includes the pump, piping, instruments, and controls to ensure the availability of an OPERABLE flow path capable of taking suction from the EFWST and delivering water to the steam generators. The eight day completion time for 2.5(1)A provides a limit on the maximum time allowed for any combination of conditions to be inoperable during any continuous failure to meet the LCO. With one of the required AFW trains inoperable, actions must be taken to restore OPERABLE status within 24 hours. With no AFW trains OPERABLE the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting cooldown with nonsafety grade equipment. In such a condition the unit should not be perturbed by any action, including a power change, that might result in a trip.

The minimum amount of water in the emergency feedwater storage tank is the amount needed for 8 hours of such operation. The tank can be resupplied with water from the raw water system.⁽¹⁾

A closure time of 4 seconds for the main steam stop valves is considered adequate time and was selected as being consistent with expected response time for instrumentation as detailed in the steam line break analysis.⁽²⁾⁽³⁾

References

- (1) USAR, Section 9.4.6
- (2) USAR, Section 10.3
- (3) USAR, Section 14.12