Enclosure 1 to TXX-92613

BORATION SYSTEMS

BASES

TECHNICAL SPECIFICATION (3/4.1.2)

Prefix Page (as amended)	Group	Description
B3/4 1-3	3	Updates RWST volumes for Modes 5 & 6 to clarify margin versus unuseable volume. Update : The unusable volume in MODE 5 & 6 is based on the high point in the suction piping to the Centrifugal Charging Pumps. The volume above the unusable plus required is margin in the Technical Specification volume (not "system configuration"). Based on the Unit 2 calculation, the Unit 2 Centrifugal Charging Pump suction piping is more limiting than Unit 1. The unuseable volume and margin are adjusted accordingly. Change Request Number : TS-92-36.1 Commitment Register Number : Related SER : SSER : SER/SSER Impact : No
B3/4 1-3	3	Changes BAST volumes for gravity feed to clarify margin. Update : The volume above the unusable plus required is margin. There is no "system configuration" associated with this margin. Change Request Number : TS-92-36.2 Commitment Register Number : Related SER : SSER : SER/SSER Impact : No

REACTIVITY CONTROL SYSTEMS

BASES

BORATION SYSTEMS (Continued)

With the RCS temperature below 200°F, one Boron Injection System is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity changes in the event the single Boron Injection System becomes inoperable.

The limitation for a maximum of two charging pumps to be OPERABLE and the requirement to verify one charging pump to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The limitation for minimum solution temperature of the borated water sources are sufficient to prevent boric acid crystallization with the highest allowable boron concentration.

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% Δk/k after xenon decay and cooldown from 200°F to 140°F. This condition requires either 1,100 gallons of 7000 ppm borated water from the boric acid storage tanks or 7,113 gallons of 2000 ppm borated water from the RWST.

As listed below, the required indicated levels for the boric acid storage tanks and the RWST include allowances for required/analytical volume, unusable volume, measurement uncertainties (which include instrument error and tank tolerances, as applicable), ~~system configuration requirements~~, and other required volume.

Tank	MODES	Ind. Level	Unusable Volume (gal)	Required Volume (gal)	Measurement Uncertainty	~~System Config~~ (gal)	Other (gal)
RWST	5,6	21%	~~45,494~~	7,113	4% of span	~~7,113~~	N/A
	1,2,3,4	95%	45,494	70,702	4% of span	N/A	357,535*
Boric Acid Storage Tank	5,6 (gravity feed)	10%	3,221	1,100	6% of span	N/A	N/A
	5,6 (gravity feed)	20%	3,221	1,100	6% of span	3,679	N/A
	1,2,3,4	50%	3,221	15,700	6% of span	N/A	N/A

The OPERABILITY of one Boron Injection System during REFUELING ensures that this system is available for reactivity control while in MODE 6.

*Additional volume required to meet Specification 3.5.4.

Enclosure 2 to TXX-92613

REFUELING WATER STORAGE TANK

BASES

TECHNICAL SPECIFICATION (3/4.5.4)

CPSES - TECHNICAL SPECIFICATIONS (TS)
AMENDMENT / REVISION 13
DETAILED DESCRIPTION

Prefix Page (as amended)	Group	Description
B3/4 5-2	3	Corrects the actual number in the Bases Section 3/4.5.4 for the required water volume of the Refueling Water Storage Tank (RWST) from 428,437 gallons to 428,237 gallons. Revision : This change will correct the information in the bases section to make the numbers for the required water volume in the RWST reflect the numbers in the Technical Specifications Bases Section 3/4.1.2. Change Request Number : TS-92-35. Commitment Register Number : Related SER : SSER : SER/SSER Impact : No

ECCS SUBSYSTEMS (Continued)

to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The requirement to remove power from certain valve operators is in accordance with Branch Technical Position ICSB-18 for valves that fail to meet single failure considerations. Power is removed via key-lock switches on the control board.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance Requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

3/4.5.4 REFUELING WATER STORAGE TANK

The OPERABILITY of the refueling water storage tank (RWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA. The limits on RWST minimum volume and boron concentration ensure that: (1) sufficient water is available within containment to permit recirculation cooling flow to the core, (2) for small break LOCA and steam line breaks, the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes with all control rods inserted except for the most reactive control assembly, (3) for large break LOCAs, the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes with all shutdown and control rods fully withdrawn, and (4) sufficient time is available for the operator to take manual action and complete switchover of ECCS and containment spray suction to the containment sump without emptying the RWST or losing suction.

The required indicated level includes a 4-percent measurement uncertainty, an unusable volume of 45,494 gallons and a required water volume of ~~428,237~~ 428,237 gallons.

The limits on indicated water volume and boron concentration of the RWST also ensure a long-term pH value of between 8.5 and 10.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

Enclosure 3 to TXX-92613

CONDENSATE STORAGE TANK

BASES

TECHNICAL SPECIFICATIONS (3/4.7.1.3)

Prefix Page (as amended)	Group	Description
B3/4 7-3	3	Revises the values for the Condensate Storage Tank (CST) unusable volume from 12,000 gallons to 12,900 gallons and required usable volume from 250,000 gallons to 249,100 gallons in Section 3/4.7.1.3. Revision : The calculations used to determine the critical depth for vortex formation and the CST usable volume were revised to reflect a more conservative approach utilizing design guidelines derived from actual installations in lieu of an analytical model. The resultant reduction in usable CST volume is within the margin used in establishing Technical Specification Section 3.7.1.3 limitations of 53% minimum CST water level and is therefore acceptable. Change Request Number : TS-91-19. Commitment Register Number : Related SER : SSER : SER/SSER Impact : No

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss-of-offsite power.

Each electric motor-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 430 gpm to two steam generators at a pressure of 1221 psig to the entrance of the steam generators. The steam-driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 860 gpm to four steam generators at a pressure of 1221 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

The Auxiliary Feedwater System is capable of delivering a total feedwater flow of 430 gpm at a pressure of 1221 psig to the entrance of at least two steam generators while allowing for: (1) any possible spillage through the design worst case break of the main feedwater line; (2) the design worst case single failure; and (3) recirculation flow. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce Reactor Coolant System temperature to less than 350°F at which point the Residual Heat Removal System may be placed in operation. The test flow for the steam-driven auxiliary feedwater pump at a pressure of greater than or equal to 1450 psid ensures this capability.

The auxiliary feedwater flow path is a passive flow path based on the fact that valve actuation is not required in order to supply flow to the steam generators. The automatic valves tested in the flow path are the Feedwater Split Flow Bypass which are required to be shut upon initiation of the Auxiliary Feedwater System to meet the requirements of the accident analysis.

Both steam supplies for the turbine-driven auxiliary feedwater pump must be OPERABLE in order to meet the design bases for the complete range of accident analyses. The allowed outage time for one inoperable steam source is consistent with the lower probability of the worst case steam or feedwater line break accident.

3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 18 hours with steam discharge to the atmosphere concurrent with total loss-of-offsite power or 4 hours at HOT STANDBY followed by a cooldown to 350°F at a rate of 50°F/hr for 5 hours. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics. The required indicated level includes a 3.5-percent measurement uncertainty, an unusable volume of [redacted] gallons and a required usable volume of [redacted] gallons. 249,100 12,900

NUREG-0737, Item II.E.1.1 requires a backup source to the CST which is the CPSES Station Service Water System, which can be manually aligned, if required in lieu of CST minimum water volume.