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File No.: G9.17

Mr. George W. Knighton, Chief
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Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Responses to DSER/FSAR Items: AFWST - Storage Capacity

Dear Mr. Knighton:

The attachments enclosed provide STP's response to Draft Safety Evaluation Report (DSER) or Final Safety Analysis Report (FSAR) items.

The item numbers listed below correspond to those assigned on STP's internal list of items for completion which includes open and confirmatory DSER items, STP FSAR open items and open NRC questions. This letter was given to your Mr. N. Prasad Kadambi on October 8, 1985 by our Mr. M. E. Powell.

The attachments include mark-ups of FSAR pages which will be incorporated in a future FSAR amendment unless otherwise noted below.

The items which are attached to this letter are:

Attachment	Item No.*	Subject
1	Q440.30N	AFWST - Storage Capacity

*Legend
D - DSER Open Item
C - DSER Confirmatory Item
F - FSAR Open Item
Q - FSAR Question Response Item

If you should have any questions concerning this matter, please contact Mr. Powell at (713) 993-1328.

Very truly yours,

M. R. Wisenburg
Manager, Nuclear Licensing

MRW/lp

Attachments: See above

cc:

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Revised 9/25/85

STP FSAR

Question 440.30N

With regard to the information in Appendix 5.4A "Cold Shutdown Capability" identify the most limiting single failure with regard to cooldown capability and verify that the statement of Table 5.4A-1 that the auxiliary feedwater storage tank (AFST) "capacity of 500,000 gallons is adequate to support 4 hours at hot standby conditions followed by 10 hours cooldown to RHR cut in condition with a margin for contingencies" considers this failure.

Response

~~The response to this~~ question will be provided in a later ~~amendment~~.

INSERT A

INSERT A

Question 440.30 Response

The most limiting failure regarding cooldown time is the loss of "A" train AC power, which results in the loss of two team generator PORV's. RHR cutin conditions can be achieved 20 hours after reactor trip based on maintaining hot standby for four hours followed by a ten hour natural circulation cooldown and then a six hour soak period. Approximately 420,000 gallons of water would be added to the steam generators during this period.

Specifically the AFST sizing considers: 4 hours at hot standby, 10 hour natural circulation cooldown, 6 hour soak period. It also considers possible level instrument error, water lost through the turbine lube oil cooler, various small system water losses (ie. flange or pump seal leakage) and a margin against vortex formation. The net useable volume in the AFST is 445,000 gallons.

The AFWS is also designed for the following normal plant operations. | 39

10.4.9.1.1 Plant Cold Startup: The AFWS is designed to back up the main FW system during plant startup in the event the main FW system and/or the startup SGFP is unavailable.

10.4.9.1.2 Plant Hot Shutdown: The AFWS is designed to back up the main FW system during plant hot shutdown (or hot standby) in the event the main FW system and/or the startup SGFP is unavailable. The AFWS can be used as a means of continuous FW supply even if this condition is maintained for extended periods. FW is continuously supplied from the AFST, which during normal operation receives required makeup from the demineralized water storage tank (DWST). The DWST in turn is supplied by water from wells through the demineralizers, as shown on Figures 9.2.3-1 and 9.2.6-1. | 45

10.4.9.1.3 Plant Cold Shutdown: The AFWS is designed to back up the main FW system when achieving plant cold shutdown.

10.4.9.2 System Description. One AFWS is provided for each unit. The piping diagram is shown on Figure 10.4.9-1. The system includes an adequate water storage, redundant pumping capacity to supply the SGs, associated piping, valves, and instrumentation. | 39

The AFWS supplies water to the SGs, where it is converted into steam by the heat transferred from the primary coolant that removes decay heat from the reactor core and heat generated in the primary coolant loop by the reactor coolant pumps. | 39

The AFST provides water to the AFW pumps. It is a concrete, stainless steel lined, 500,000 gallon tank with capacity based on: | 31

- maintaining the plant in hot standby for four hours, then
- cooling down the primary system to 350°F, ~~the point at which the residual heat removal system may be initiated~~ then

The cooldown rate is 50°F/hr with one RCP operating or 25°F/hr with natural circulation. During normal cooldown the rate is limited to 100°F/hr due to structural limits of the RCS components. | 39

Four AFW pumps, each with independent motive power supplies, are provided to comply with redundancy requirements of the safety standards, both for equipment and power supplies. Pump characteristics are given in Table 10.1-1. | 46 | 39

Three horizontal, centrifugal, multistage, electric motor-driven pumps supply one SG each. Each pump motor is supplied power from a separate engineered safety bus, and the power supply is separated throughout.

- maintaining a 6 hour soak period after which the residual heat removal system may be initiated.

TABLE 5.4.A-1

COMPLIANCE COMPARISON WITH BRANCH TECHNICAL POSITION RSB 5-1

Design Requirements of BTP RSB 5-1	Process and [System or Component]	Possible Solution for Full Compliance	Recommended Implementation for Class 2 plants*	Degree of STP Compliance**
V. Test requirement Meet RG 1.68 for PWRs, test plus analysis for cooldown under natural circulation to confirm adequate mixing and cooldown within limits specified in Emergency Operating Procedures.		Run tests and confirming analysis to meet requirement.	Compliance required.	Meets the intent of RG 1.68. Test data and analysis for a plant similar in design to STP will verify adequate mixing and cooldown under natural circulation conditions (Section 14.2).
VI. Operational procedure Meet RG 1.33. For PWRs, include specific procedures and information for cooldown under natural circulation.		Develop procedures and information from tests and analysis.	Compliance required.	Generic Procedures as developed by the Westinghouse Owners Group will be used as the basis for plant specific procedures.
VII. Auxiliary Feedwater Supply Seismic Category I supply for auxiliary feedwater for at least four hours at hot ~~shutdown~~ standby plus cooldown to residual heat removal cut-in based on longest time for only onsite or only offsite power and assumed single failure.	Emergency feedwater supply	From tests and analysis obtain conservative estimate of auxiliary feedwater supply to meet requirements and provide Seismic Category I supply.	Compliance will not be required if it is shown that an adequate alternate Seismic Category I source is available.	The AFST capacity of 500,000 gals is adequate to support 4 hrs at hot standby followed by 10 hrs cooldown to RHR cut in conditions with a margin for contingencies. The AFST meets Seismic Category I requirements (Section 10.4.7)

temperature followed by a 6 hour soak period

followed by a 6 hour soak period

NOTES:

* The implementation for Class 2 plants does not result in a major impact while providing additional capability to go to cold shutdown. The major impact results from the requirement for safety-related steam dump valves.

** STP falls within the category of a Class 2 plant as defined by Section B, "Implementation," of Branch Technical Position RSB 5-1, Revision 2.

5.4-A-6 Amendment 38

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Attachment 1
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