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September 22, 1988
ST-HL-AE-2790
File No.: G20.02.01, M20.1
10CFR50

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Response to Additional NRC Questions Raised
On Use of High Density Spent Fuel Racks

Reference (1): HL&P Letter to USNRC, ST-HL-AE-2417, dated March 8, 1988; Expansion of the Spent Fuel Pool Storage Capacity Using High Density Spent Fuel Racks.

(2): HL&P Letter to USNRC, ST-HL-AE-2738, dated August 10, 1988; Summary of Meeting on July 11 & 12, 1988 to discuss High Density Spent Fuel Racks.

(3): HL&P Letter to USNRC, ST-HL-AE-2750, dated August 9, 1988; Summary of NRC Technical Audit of U. S. Tool & Die, Inc. on July 20 to 21, 1988.

(4): HL&P Letter to USNRC, ST-HL-AE-2756, dated August 19, 1988; Response to NRC Questions

(5): HL&P Letter to USNRC, ST-HL-AE-2764, dated August 30, 1988; Revised Responses to NRC Questions.

Based on recent discussions with the NRC regarding the High Density Spent Fuel Rack proposed Licensing Amendment (reference 1), additional questions have been raised. These questions are unrelated to the questions directed toward analysis/design of the racks and building which were covered in the previous audits and correspondence (references 2 through 5). Attachment # 1 provides the questions and Houston Lighting and Power's responses. In order to prevent possible confusion with previous responses, the questions and responses are in order starting with question # 28. Attachment # 2 provides an excerpt from the Environmental Report Section 3.4 which relates to Question # 28.

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If you should have any questions on this matter, please contact Mr. A. W. Harrison at (512) 972-7298.

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Attachments: (1) Responses to Additional NRC Questions
(2) Section 3.4.1.1, page 3.4-2 of STP Environmental Report-Construction Permit Stage

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Revised 08/24/88

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ATTACHMENT (1)
RESPONSES TO ADDITIONAL NRC
QUESTIONS

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QUESTION #28:

What is the impact of the additional heat load rejected to the environment due to the increased spent fuel pool storage?

RESPONSE #28:

Section 5.2.4 of the High Density Spent Fuel Rack Proposed Licensing Amendment (reference 1) discusses the total increase in heat load rejected to the environment through the cooling systems due to the increased spent fuel storage over the total waste heat rejected to the environment by the STP plant. As stated in this section, the increase is very small and would have a negligible impact on the environment. It also states that the heat load increase does not alter the existing design basis in any way.

The actual heat load increase can be found in Attachment 4 to the Licensing Amendment, FSAR Table 9.1-1. For the SRP 'Abnormal Maximum' case, the heat load increases from 61.4×10^6 Btu/hr to 63.2×10^6 Btu/hr. Table 5.1 of the Licensing Amendment also provides the increased heat load of 63.2×10^6 Btu/hr. This increase of 1.8×10^6 Btu/hr is negligible in comparison to the gross heat rejection rate reported in Section 3.4.1.1 of the STP Environmental Report - Construction Permit stage (attachment 2) of 17.25×10^9 Btu/hr at 100 percent plant load factor.

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QUESTION #29:

What type of evaluation has been done to determine the increase in radiation exposure through the walls and floor of the spent fuel pool as a result of the increased spent fuel storage in the high density racks?

RESPONSE #29:

The analysis determining the required shielding for the spent fuel pool was reviewed to assess the radiological impact of the addition of high density spent fuel racks in the spent fuel pool. The radiation zones shown on FSAR Figures 12.3.1-13 through 12.3.1-16 for the Fuel Handling Building do not change as a result of the high density racks. The areas adjacent to the spent fuel pool and below the spent fuel pool are Zone 2. The Zone 2 criteria, 2.5 mR/hr, is not exceeded with the addition of the high density fuel racks.

In the event of a full core off-load, 193 assemblies, the dose rate through the walls of the spent fuel pool will not exceed the Zone 2 criteria. However, the dose rate through the spent fuel pool floor is expected to increase to 3.2 mR/hr, slightly exceeding the Zone 2 criteria (as it would have with the original rack design). Since the occurrence of a full core off-load would be an uncommon event resulting in a significant increase in source term, the Radiation Shield Verification Survey Program would require new surveys to be taken of areas around the spent fuel pool. If actual conditions dictate, administrative controls would be put in effect to limit personnel access.

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QUESTION #30:

Clarify the statement in Section 6.7.4.2 B of the licensing submittal (reference 1) with regard to installation of the high density racks.

RESPONSE #30:

As stated in Section 7.5.5 of the licensing submittal (Reference 1), the installation of the new high density spent fuel pool storage racks for Unit 1 will occur before the first refueling outage. Likewise the Unit 2 racks will be installed before the first refueling, therefore there will be no irradiated materials stored in either unit's spent fuel pool prior to the time the new racks are to be installed.

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QUESTION #31:

Does STP have plant procedures for spent fuel pool makeup in case of loss of spent fuel pool cooling as described in Section 5.2.5 in the licensing submittal (reference 1)?

RESPONSE 31:

The sources of spent fuel pool makeup which include water from the Refueling Water Storage Tank (RWST), demineralized water system, and the fire water system as described in the licensing submittal, as well as in the FSAR Section 9.1.3.3.2, are covered by the following plant procedures:

1.) Spent Fuel Pool Cooling and Cleanup System (does not include the fire water system) [1POP02-FC-0001 and 2POP02-FC-0001]

2.) Seismic Event
[1POP04-SY-0001 and 2POP04-SY-0001]

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QUESTION #32:

Regarding the licensing submittal Section 7.5.3 D., how is the process of radioactive crud buildup detection and wash down covered by plant procedures?

RESPONSE #32:

Crud buildup in the spent fuel pool would be detected through routine surveys conducted in accordance with the Radiological Survey Program [plant procedure OPRP04-ZS-0001]. The survey program is established consistent with the description in the FSAR Section 12.5.3.1. Should the radiological conditions due to crud buildup excessively expose plant personnel, the spent fuel pool walls shall be washed down in accordance with the guidelines in the Area Decontamination procedure [plant procedure OPRP08-ZC-0007].

ATTACHMENT (2)
SECTION 3.4.1.1 PAGE 3.4-2 OF STP
ENVIRONMENTAL REPORT - CONSTRUCTION PERMIT
STAGE.

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3.4.1 DESIGN BASIS AND ENGINEERING FEATURES OF THE HEAT DISSIPATION SYSTEM

The following describes the major features of the Heat Dissipation System to be employed at the South Texas Project (STP) site (see Figure 3.4-1) located in the Colorado River Basin as shown in Figure 2.5-1. The major features include a 7,000-acre cooling reservoir, Essential Cooling Pond, spillway, blowdown facilities, reservoir makeup facilities, circulating water intake structure, and circulating water discharge structure as shown in Figure 3.4-1.

3.4.1.1 7,000-Acre Cooling Reservoir

The 7,000-acre cooling reservoir shown in Figure 3.4-1 is completely enclosed by approximately 13 miles of embankment consisting of clay fill which is constructed above natural ground which varies approximately from elevation 15 mean sea level (MSL) to 29 MSL. The cooling reservoir contains approximately 187,000 acre-feet (AF) of water at normal maximum operating elevation 49 MSL. The Reservoir is sized so that the thermal performance for two-unit operation and the resulting evaporative losses (based on a total of 2,624 Mwe which corresponds to a gross heat rejection rate of 17.25×10^9 Btu/hr) at 100% plant load factor require approximately 162,400 AF of storage based on the operational constraints as outlined in this section. This storage is required to offset the losses resulting from plant-induced evaporation, net natural evaporation, and blowdown assuming an 80 percent annual load factor. Storage in the reservoir is also required to account for the intermittent operation of makeup due to flow restrictions in the Colorado River. The thermal performance of the 7,000-acre surface is also examined for future four-unit capabilities resulting in an optimum thermal performance (assuming a total of 5,248 Mwe which corresponds to a gross heat rejection rate of 34.5×10^9 Btu/hr under a plant load factor of 100 percent). The plant intake temperatures are evaluated for plant load factors of 100 and 90 percent with the 100 percent plant factor producing an increase in intake temperature of 0.15°F (92.78°F for 90 percent plant load factor and 92.93°F for 100 percent plant load factor). The thermal performance and reservoir operation are detailed in Section 3.4.2. The calculated mean monthly induced evaporation utilizing the energy budget concept[1] are presented in Table 3.4-1. 8

The embankment surrounding the reservoir will be constructed of compacted clay fill excavated from within the reservoir. The side slopes of the embankment will be 3:1 (horizontal: vertical) on the exterior and 2.5:1 on the reservoir side. The top of embankment varies from elevation 65.75 MSL to elevation 67.00 MSL. These elevations are selected in order to protect against overtopping in the event of a Standard Project Flood in the reservoir with coincident wind-wave and 3