Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

April 26, 2010
U7-C-STP-NRC-100096

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Revised Response to Request for Additional Information

Reference: Letter, Mark McBurnett to Document Control Desk, "Response to Request for Additional Information," dated February 18, 2010 (U7-C-STP-NRC-100045, ML100790278)

Attached is a revised response to an NRC staff question included in Request for Additional Information (RAI) letter number 310 related to Combined License Application (COLA) Part 2, Tier 2, Section 9.2.5. The original response to this RAI was provided in the Reference. This revised response replaces the original response in its entirety and completes the response to NRC letter number 310.

The Attachment provides a revised response to the RAI question listed below:

RAI 09.02.05-9

The COLA changes in this response will be implemented at the first routine COLA Update following NRC acceptance of this response.

There are no commitments in this letter.

If you have any questions regarding this response, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

D091

STI 32662857 NRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4/26/2010

Mark McBurnett
Vice President, Oversight & Regulatory Affairs
South Texas Project Units 3 & 4

jaa

Attachment:
RAI 09.02.05-9 Revision 1

cc: w/o attachment except*
(paper copy)

Director, Office of New Reactors
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Kathy C. Perkins, RN, MBA
Assistant Commissioner
Division for Regulatory Services
Texas Department of State Health Services
P. O. Box 149347
Austin, Texas 78714-9347

Alice Hamilton Rogers, P.E.
Inspection Unit Manager
Texas Department of State Health Services
P. O. Box 149347
Austin, Texas 78714-9347

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

*Steven P. Frantz, Esquire
A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP
1111 Pennsylvania Ave. NW
Washington D.C. 20004

*Tom Tai
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852

(electronic copy)

*George F. Wunder
*Tom Tai
Loren R. Plisco
U. S. Nuclear Regulatory Commission

Steve Winn
Joseph Kiwak
Eli Smith
Nuclear Innovation North America

Jon C. Wood, Esquire
Cox Smith Matthews

Richard Peña
Kevin Pollo
L. D. Blaylock
CPS Energy

RAI 09.02.05-9 Revision 1

QUESTION:

The ultimate heat sink (UHS) system must be designed to reject the required amount of heat under all conditions to satisfy GDC 44. The applicant did not state nor justify the amount of the excess margins that are included in the design to account for uncertainties, component wear and aging effects, fouling of heat transfer surfaces and spray nozzles, strainer debris collection, etc. This generated RAI 9.2.5-3. In the applicants response to this RAI (letter dated August 28, 2009; Ref: U7-C-STP-NRC-090123) the applicant stated that design of the UHS has not been finalized, and thus margins could not be provided. The applicant stated that their goal was to provide margins, and provided margins for related systems. The applicant also stated that margins for the UHS will be included in the performance requirements within the procurement process. Review of this information must be performed prior to issue of the SER. Provide the schedule information as to the when the information will be available and how it will be made available for NRC review.

REVISED RESPONSE:

The original response to this RAI was submitted with the STPNOC Letter No. U7-STP-NRC-100045, dated February 18, 2010. In a teleconference with the NRC on March 29, 2010, the NRC requested the applicant to provide a discussion of the design process used to ensure that adequate margin exists in the Reactor Service Water (RSW) system design. This revised response provides this information and supersedes the original response.

The RSW system, which is integral with the Ultimate Heat Sink (UHS), relies on three major components to transfer heat from the Reactor Building Cooling Water (RCW) system heat exchangers to the UHS; the RSW system pumps, the RCW system heat exchangers and the UHS cooling towers. The RSW system self-cleaning strainers are also of interest due to the increased pressure drop experienced across the component with increased debris accumulation. The following paragraphs provide a discussion of the design process and the preliminary design margins for these components, to allow for uncertainties. The final values of these margins will be known upon incorporation of the details of the as-installed/as-purchased components into the final design.

RSW System Pumps:

The RSW pumps are specified with 10% additional margin for Total Developed Head (TDH) and flow rate, over and above the required values, using the most limiting input parameters. Minimum Net Positive Suction Head available (NPSHa) was also

determined using the most limiting input parameters and conservatively reduced by 10% for RSW pump procurement.

The required system flow rates are identified in FSAR Table 9.2-18. Both the required accident and normal operating flow rates are analyzed in a hydraulic calculation, which is used to determine the required RSW pump TDH and the minimum NPSHa. To provide bounding pump design inputs, this hydraulic calculation models the RSW system in its most limiting condition. For example, the UHS basin water level is assumed to be at its lowest level after 30 days of operation post accident to maximize the TDH required and minimize the NPSHa. Cold water cases, which maximize the service fluid (water) density, are also considered to maximize the TDH required. Equipment, piping and components are assumed to be in their most fouled or degraded condition.

RCW System Heat Exchangers:

The heat transfer capacities specified for the RCW heat exchangers are provided in FSAR Table 9.2-4d. As explained in STD DEP 9.2-1, these capacities are based on accident heat loads, and provide a performance margin of 20% to allow for fouling.

RSW System UHS Cooling Towers:

The total heat load for the most bounding RSW division (Division B), presented in FSAR Table 9.2-22, is considered in determining the heat transfer capacities of the UHS cooling towers. An energy balance, using this heat load, is evaluated to determine the required cooling tower range (the difference between the hot water inlet temperature and cold water outlet temperature). The selected range of 8°C, described in FSAR Section 9.2.5.6, bounds the required cooling tower range. The divisional heat transfer capacities of the UHS cooling towers are specified to be greater than the divisional heat transfer capacities of the RCW heat exchangers discussed above, which preserves the 20% margin of the RCW heat exchangers.

RSW System Strainers:

The RSW system strainers are of the self-cleaning type, limiting the differential pressure loss across the strainer due to debris collection by initiating a cleaning cycle when the differential pressure reaches a predetermined set point. A conservative differential pressure has been assumed in the RSW system hydraulic calculation, discussed above.

In addition to applying margin during the design phase, the RSW system performance is monitored to ensure that the components discussed above are in adequate operating condition and that sufficient margin exists to perform their safety related functions. Instrumentation exists for monitoring the following RSW system operating parameters:

1. RSW pump suction and discharge pressure
2. RSW strainer differential pressure
3. RCW heat exchanger differential pressure
4. UHS basin water temperature
5. RSW supply header temperature
6. RSW return header flow and temperature

As a result of this RAI response, the following changes will be made to the COLA:

The fourth paragraph of COLA Rev. 3, Part 2, Tier 2, Subsection 9.2.5.6 will be revised as follows:

The cooling tower cells are designed to remove the heat loads identified in Tables 9.2- 4a, 9.2-4b, and 9.2-4c. During normal operation, only one cell is required to be in operation in each division at a flow rate of 3,240 m^3/h. During all the other modes of operation, initially two cells are required to be in service at flow rates of 4,860 m^3/h (2430 m^3/h per cell). The maximum airflow rate of each cooling tower fan is 1,587,839 m^3/h. Design temperature for cold water leaving the cooling tower is 35°C (the maximum acceptable water temperature at the RCW heat exchanger inlet). A cooling tower range (the difference between hot water inlet temperature and cold water outlet temperature) of 8°C has been selected for cooling tower design. This range bounds the required cooling tower range, considering the largest RCW heat exchanger heat loads to be dissipated by the cooling towers. This corresponds to a maximum water temperature at the cooling tower inlet of 43°C.

COLA Rev. 3, Part 2, Tier 2, Subsection 9.2.15.2.3(3) will be revised as follows:

During normal plant operation, only one RSW pump and two RCW heat exchangers are in operation in each division. During other modes of operation, the second pump and the third heat exchanger are placed in operation, as required, in each division. The required RSW pump TDH and the minimum NPSH available to the RSW pumps are based on a hydraulic analysis of the RSW system. To provide bounding pump design inputs, this hydraulic analysis models the RSW system in its most limiting condition. Operating characteristics of the RSW pumps are provided in Tables 9.2-13 and 9.2-17.