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August 18, 2009
U7-C-STP-NRC-090108

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Request for Additional Information

Attached are responses to NRC staff questions included in Request for Additional Information (RAI) letter number 161 related to Combined License Application (COLA) Part 2, Tier 2 Chapter 19. The attachments contain the responses to the RAI questions listed below:

19-19

19-20

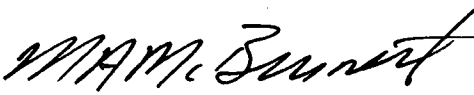
19-21

When a change to the COLA is indicated, the change will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no new commitments in this letter. Commitment COM 19Q-1 is deleted as part of the Response to RAI question 19-20.

If you have any questions regarding these RAI responses, please contact me at (361) 972-7206, or Bill Mookhoek at (361) 972-7274.

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

Executed on 8/18/09 

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

dws

Attachments:

1. Question 19-19
2. Question 19-20
3. Question 19-21

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

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QUESTION 19-19:

In Section 19.2, Table 19.2-2 of the STP FSAR, Rev. 2, "PRA Assessment of STP COLA Departures from ABWR DCD", Departure STP DEP 9.2-5 (Reactor Service Water [RSW] system), it is stated that only the portion of the RSW in the CB was described in the ABWR DCD, remaining portion is not contained in the ABWR DCD. STP provided the plant specific description of RSW in FSAR Section 9.2.15. The potential impact of this departure on PRA was stated in 19.3 (Internal Event), 19.4 (External Event and Shutdown Risk), 19.11 (Human Action), 19Q (Shutdown Risk) and 19R (Probabilistic Flooding Analysis). However, there was no discussion of the potential impact of this system on the fire risk in Section 19M. Please explain if this system is included in the fire risk assessment, and if so, please discuss their impact on the fire risk.

RESPONSE

Appendix 19M of the DCD included analysis of the "intake structure" associated with the reactor service water (RSW) system. As described in Section 19M.2:

(1) A safety-related building grouping consisting of the reactor building except primary containment, control building except the control room complex, and the intake structure. This grouping contains all of the equipment required for safe shutdown except that within primary containment and the control room complex. The buildings are subdivided by three hour rated fire barriers into fire areas corresponding to the safety divisions. Each division is considered as a unit, although each division encompasses several fire areas in three buildings. For these groupings, it is conservatively assumed that a fire at any location in a divisional fire area results in the immediate loss of function of the division. This precludes having to calculate the rate of spread and possible magnitude of a fire within a fire area. The requirement that the fire containment system be capable of confining any fire within the fire area of origin is documented in Subsection 9.5.1.

In Section 19M.4.1.6, the intake structure is identified as a "significant fire area." Other Sections of Appendix 19M describe the screening process used as part of the EPRI FIVE evaluation.

Tier 1 Chapter 2.11.9, Reactor Service Water System, lists the Interface Requirements for the RSW system, and item (2) describes the fire barrier requirements, which include inter-divisional boundaries (including walls, floors, doors and penetrations) that have a three-hour fire rating. These requirements are unchanged in the STP 3 & 4 COLA.

These sections and other sections of 19M relating to the detailed fire assessment of the RSW pump house, or "intake structure," are incorporated by reference in the STP 3 & 4 COLA. The system is included in the fire risk assessment, and the impact has been evaluated in the DCD.

No COLA revision is required as a result of this RAI response.

QUESTION 19-20:

In accordance with 10CFR Part 52, a COL application is required to contain a description of the plant-specific PRA and its results. In addition, if the COL application references a design certification, then the plant-specific PRA information should be updated to account for site-specific design information and any design changes or departures. The staff reviewed the shutdown hurricane risk discussion outlined in Section 19.Q.6 of the STP FSAR. The Abnormal Procedure for STP Units 1 & 2 which covers hurricanes, requires a plant shutdown prior to the arrival on site of hurricane winds in excess of 73 miles per hour. The applicant stated that the tornado analysis provided in the reference ABWR DCD would bound the hurricane analysis with respect to high winds. There is no site-specific analysis to support this assumption. The staff is requesting the applicant to provide the following information, as applicable, associated with the site-specific high winds shutdown risk assessment that considers the shared fire water system:

- a. High Winds Shutdown CDF and LERF.
- b. Top 100 cutsets for CDF and LERF.
- c. Description of the significant core damage sequences and large release sequences.
- d. Risk-importance measures Fussel-Vessel (FV) and Risk Achievement Worth (RAW) for component basic events.
- e. Risk-importance measures (FV and RAW) for HEPs (human error probabilities).
- f. Risk-importance measures (FV and RAW) for CCFs (common cause failures).
- g. List of SSCs that were identified as risk significant for input into the RAP program.
- h. Description of the methodology used to identify risk significant SSCs for input into the RAP program.

RESPONSE

The STP 3 & 4 site is within the high wind parameters defined in the Design Control Document (DCD) as described in COLA Table 2.0-2. High winds and tornados were evaluated in the DCD in Chapter 19.4.2 and with the conclusion stated below:

Evaluation of these event trees on the conservative bases listed above yields an expected total core damage frequency due to tornado-initiated events of $1.1E-08$ per year. This is quite small compared to the internal events result and the core damage frequency goal. Since tornado-induced events are predicted to be such small contributors to core damage frequency, this high level evaluation is judged to be sufficient and a more detailed analysis is not warranted.

Chapter 19B.2.44, 103: Design for Probable Maximum Precipitation further discusses tornados and high winds as follows:

Since the ABWR is designed in accordance with GDC 2 for the most severe expected environment conditions, including flooding, tornado, hurricane etc., and meets the intent

of SRP Section 2.4.2, Revision 3; SRP Section 2.4.3, Revision 3; and GL 89-22 with respect to plant design, this issue is resolved for the ABWR design.

In DCD Chapter 19.9.30, PRA Update, the requirements for the site PRA includes the following statement:

In addition, site characteristics such as river flooding, wind loadings, etc., will be compared to those assumed in the design PRA to ensure it is bounding. If the existing PRA is not bounding for site characteristics, then a risk based evaluation should be performed.

The site-specific PRA required by 10CFR50.71(h) is required to evaluate all external events and all modes of operation and complete the evaluation and analysis by fuel load using codes and standards endorsed by the NRC at least one year prior to fuel load. This evaluation will include the effects of high winds and hurricanes during shutdown modes.

Because the STP 3 & 4 site is within the site parameters defined in the DCD, and high winds were reviewed as part of the DCD approval, the paragraphs addressing Hurricane Risk will be removed from FSAR Appendix 19Q.6, Flooding and Fire Protection, and the associated FSAR commitment (COM 19Q-1) will be deleted, as shown below:

Hurricane Risk

The Abnormal Procedure for STP Units 1 & 2, which covers hurricanes and external floods, requires a plant shutdown prior to the arrival on site of hurricane winds in excess of 73 miles per hour. Therefore, the risk of hurricane damage is addressed as part of the shutdown risk evaluation.

Per the STP 3 & 4 external flooding evaluation, the storm surge from a hurricane was determined to result in a water level below plant grade.

Due to the likely impact on switchyard equipment, the hurricane is modeled to result in an extended loss of offsite power event. Given that the hurricane would not result in a storm surge to threaten additional plant equipment, the hurricane risk is judged to have a small quantitative impact on shutdown risk. In addition, the tornado analysis provided in Section 19.4.2 of the reference ABWR DCD would bound the hurricane analysis with respect to high winds. High winds would also result in an extended loss of offsite power event. With three EDGs available for sources of safety-related AC power, Section 19.4.2 of the reference ABWR DCD identifies that the tornado-induced core damage frequency is small compared to the internal events core damage frequency. The tornado-induced risk is bounded by the internal events LOOP analysis provided in Appendix 19D.4. The onsite fuel oil supply supports seven days of continuous EDG operation to cope with extended LOOP events. In addition, long-term fuel supply arrangements are in place to provide fuel oil from offsite sources within seven days. The hurricane-induced risk is

insignificant compared to the tornado induced risk. The ABWR DCD remains bounding for shutdown risk.

In order to reduce the risk in responding to an approaching hurricane, STP 3 & 4 commits to developing a procedure prior to fuel load to cope with impending hurricanes.
(COM-19Q-1)

QUESTION 19-21:

In accordance with 10CFR Part 52, a COL applicant is required to contain a description of the plant-specific PRA and its results. In addition, if the COL application references a design certification then the plant-specific PRA information should use the PRA information for the design certification and be updated to account for site-specific design information. The staff reviewed the internal and external shutdown flood risk discussion in Section 19.Q.6 of the STP FSAR. The applicant stated that the risk during shutdown from internal and external floods is very small. Although site specific internal and external full power flooding sequences were evaluated in Section 19.R of the STP FSAR, there is no risk analysis or estimation of the site-specific shutdown frequency of internal and external floods. The staff is requesting the applicant to provide the following information, as applicable, associated with the site-specific shutdown risk assessment of internal and external flooding events:

- a. Total CDF and LRF.
- b. Top 100 cutsets for CDF and LRF.
- c. Description of the significant core damage sequences and large release sequences.
- d. Risk-importance measures including Fussel-Vessel (FV) and Risk Achievement Worth (RAW) for component basic events.
- e. Risk-importance measures (FV and RAW) for HEPs (Human Error Probabilities).
- f. Risk-importance measures (FV and RAW) for CCFs (Common Cause Failures)
- g. List of SSCs that were identified as risk significant SSCs for input into the RAP program.
- h. Description of the methodology used to identify risk significant SSCs for input into the RAP program.

RESPONSE

Internal flooding during shutdown was evaluated in the Design Control Document (DCD) in Appendix 19Q.6, Flooding, with procedural controls identified as a necessary barrier to prevent and minimize the effects of flooding, and incorporated by reference in FSAR Appendix 19Q. Additional design requirements identified for the RSW pump rooms in FSAR Section 19Q.6 ensure that the internal flooding assessment, including the procedural controls, performed in the DCD for shutdown conditions remains bounding for STP 3 & 4. Because the internal flooding analysis in the DCD remains bounding, STP does not need to provide site-specific information related to the risk analysis of internal floods per Regulatory Guide 1.206 Section C.III.I.19.

The external flooding analysis described in Appendix 19R of the STP 3 & 4 COLA was performed on an annual frequency basis and, as such, is independent of plant operating mode. The response to Request for Additional Information question 19.01-10 includes a summary of the results of the external flooding assessment performed for the main cooling reservoir breach design basis flooding event.

No COLA revision is required as a result of this RAI response.