

South Texas Project Electric Generating Station 4000 Avenue F - Suite A Bay City, Texas 77414

May 19, 2010 U7-C-STP-NRC-100112

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 Response to Request for Additional Information

Reference:

 Letter, Scott Head to Document Control Desk, "Response to Request for Additional Information," dated April 14, 2010, U7-C-STP-NRC-100025.
Letter, Mark McBurnett to Document Control Desk, "Response to Request for Additional Information," dated January 14, 2010, U7-C-STP-NRC-100017 (ML100190245).

This letter revises the response to Request for Additional Information (RAI) 17.4-9 provided in Reference 1. Attachment 1 addresses the following RAI:

17.4-9 Response, Revision 2

In addition, this letter supplements the response to RAI 19.01.-25 provided in Reference 2. Attachment 2 addresses the following RAI:

19.01-25 Supplemental Response

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

Commitment COM 19A-1 is modified as a result of the supplemental response to RAI 19.01-25 in Attachment 3. Attachment 4 summarizes a new commitment, COM 19B-2, for the required testing, inspection and replacement guidance for Generic Issue A-47; Safety Implications of Control Systems.

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

STI 32679341

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

Executed on <u>5719/10</u> L

Scott Head Manager, Regulatory Affairs South Texas Project Units 3 & 4

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Attachment:

- 1. RAI 17.4-9 Response, Revision 2
- 2. RAI 19.01-25 Supplemental Response
- 3. Summary of Commitment COM 19A-1
- 4. Summary of Commitment COM 19B-2

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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

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RAI 17.4-9, Revision 2

QUESTION:

The staff requested in RAI 17.4-1 that STP include in Section 19K of the STP FSAR the specific SSCs that are in scope of the RAP associated with the risk-significant common cause failures (CCFs) of the HPCF, RHR, RBCW, and RSW systems. In response to RAI 17.4-1, STP proposed to include in FSAR Section 19K those SSCs of the HPCF, RHR, RBCW, and RSW systems whose CCFs are significant contributors to system unavailability or core damage frequency (CDF), which are identified in the ABWR Standard Safety Analysis Report (SSAR), Section 19D.8.6. As explained below, the staff found that the SSCs of the HPCF, RHR, RBCW, and RSW systems that STP proposed to add to the scope of RAP as a result of CCFs may not be complete.

Based on Section 19D.8.6 of the ABWR SSAR, the following SSCs are considered in the CCF sensitivity analysis for the HPCF, RHR, RBCW, and RSW systems: pumps, pump auxiliary equipment, manual valves, motor-operated valves, check valves, room air conditioners, spargers, strainers, circuit breakers, flow transmitters, heat exchangers, and temperature elements. Section 19D.8.6 of the ABWR SSAR also identified the most significant CCF contributors to system unavailability or CDF for these systems (e.g., pumps, strainers, room air conditioners). It should be noted, however, that those SSCs whose CCFs are not significant contributors to system unavailability or CDF can still be risk important (i.e., the CCFs of these SSCs can have a high risk achievement worth (RAW) or Fussell Vesely (FV)), and, therefore, should be evaluated for inclusion in the scope of RAP. For example, based on the discussion in Section 19D.8.6 of the ABWR SSAR, CCF of the HPCF pumps is a significant contributor to system unavailability or CDF and has a high risk importance according to Table 19K-1 of the STP FSAR. While CCF of the HPCF check valves may not be a significant contributor to system unavailability or CDF, its CCF risk importance (e.g., RAW) would be very similar to that of the HPCF pumps, and, therefore, should be include in the scope of RAP.

Since Section 19D.8.6 of the ABWR SSAR addresses CCF of numerous SSCs for the HPCF, RHR, RBCW, and RSW systems (e.g., the CCFs of pumps, pump auxiliary equipment, manual valves, motor-operated valves, check valves, room air conditioners, spargers, strainers, circuit breakers, flow transmitters, heat exchangers, and temperature elements), the staff requests that the applicant re-evaluate these SSCs for inclusion in RAP considering their CCF risk importance (e.g., RAW and FV).

REVISED RESPONSE:

This response revises the response originally provided for the staff's Request for Additional Information (RAI) number 17.4-9 in letter U7-C-STP-NRC-100025, dated April 14, 2010, as indicated below.

The SSCs identified in the question above (e.g., pump auxiliary equipment, manual valves, motor-operated valves, check valves, room air conditioners, spargers, strainers, circuit breakers,

RAI 17.4-9, Response, Revision 2

flow transmitters, heat exchangers, and temperature elements) will be evaluated by the Design Reliability Assurance Program (D-RAP) Expert Panel using the process described in FSAR Section 17.4S.1.4 as detailed design progresses.

The current schedule is to complete a majority of the system reviews under the D-RAP program by the end of 2010 and to complete all of the system reviews, provide a list of the set of D-RAP Structures, Systems, and Components (SSCs), and have the program elements in place to control future activities by the third quarter of 2011. The FSAR will be updated in accordance with 10CFR50.71(e) to provide the Expert Panel Failure Modes and RAP activities recommendations for this set of risk-significant equipment.

No changes to the COLA are required as a result of this response. The COLA will be modified as indicated below to reflect this commitment.

17.4S.1 Identification of Site-Specific SSCs for D-RAP

The process described in the reference ABWR DCD Appendix 19K to identify risk significant systems, structures and components (SSCs) for the certified and approved ABWR was also used for initial identification of the site specific, risk-significant SSCs during COLA preparation. This was accomplished using the generic ABWR probabilistic risk assessment (PRA) model revised to include site-specific information.

The initial list of site specific SSCs and their risk rankings is included in Appendix 19K. The PRA model for STP 3 & 4 will continue to be refined over the life of the plant and this will require periodic adjustment to the risk rankings of SSCs in Appendix 19K. Appendix 19K also includes the initial maintenance/testing recommendations for these SSCs to enhance reliability. As D-RAP enters the detailed design, procurement, fabrication and construction phase, an expert panel with STPNOC representation will be established and utilized to:

- augment PRA techniques in the risk ranking of SSCs using deterministic techniques, operating experience and expert judgment
- identify risk significant SSCs not modeled in the PRA (if any)
- act as the final approver of risk significant SSCs
- recommend design changes where appropriate to reduce risk
- revise/adjust recommend operations phase maintenance/testing activities for risk significant SSCs described in Appendix 19K
- designate and chair NSSS and Architect engineer working groups as necessary to assist in accomplishing the objectives of the expert panel
- review and approve the recommendations of the working groups
- assess the overall station risk impact due to SSC performance and all implemented risk-informed programs (including D-RAP) after each plant-specific data update of the PRA.

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The expert panel is made up of members with diverse backgrounds in engineering, operations, maintenance, risk and reliability analysis, operating experience and work control. During the detailed design phase of D-RAP, each major engineering organization performing detailed design will be represented on the panel (or working groups) as deemed necessary. The composition of the panel will change during the period leading up to fuel load and operations. The panel will continue to function during operations for the life of the plant.

The expert panel will complete all of the expert panel system reviews, provide a list of the set of D-RAP SSCs, and have the program elements in place to control future activities by the third quarter of 2011. (COM 17.4-1)

RAI 19.01-25

QUESTION:

The applicant provided supplemental COL license information in Section 19.9 to address the Resolution of the COL license information, which the applicant asserted could not be completed before the issuance of the COL license. In accordance with RG 1.206, Section C, Part III, Section C.III.4, subsection C.III.4.3, the applicant is requested to provide additional information to support the issuance of COL.

Please provide your plan, including the implementation schedule, for addressing the Resolution of the COL license items and commitments in Section 19.9 and commitments in Section 19.4S, as described in RG 1.206, Section C, Part III, Section C.III.4, subsection C.III.4.3.

RESPONSE:

Sections 19.9 and 19.4S of the DCD and COLA include a number of commitments originating from the PRA. These commitments can be essentially grouped into:

- Develop Emergency Operating Procedures (EOP) and Abnormal Operating Procedures (AOP).
- Develop procedures for performing plant-specific PRA.
- Other miscellaneous procedures relating to the PRA.

EOPs and AOPs will be verified and validated in the Human Factors Engineering Program and developed on a schedule to support the Plant Operations Training Program.

Procedures for performing plant-specific PRA will be completed by one year prior to fuel load.

The plant-specific PRA will be based on as-procured and as-built data and will be completed prior to fuel load.

Other miscellaneous procedures relating to the PRA will be completed one year prior to fuel load.

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

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SUPPLEMENTAL RESPONSE:

This Supplemental Response to Request for Additional Information (RAI) item 19.01-25 provides additional information concerning COL License Information Items from Appendix 19A, and additional information concerning the COL Applicant Items in Appendix 19B. The information in this RAI supplements the information provided in U7-C-STP-NRC-100017, dated January 14, 2010 (ML100190245).

The COLA will be revised as shown below to incorporate additional information on the COL License Information Items in Appendix 19A.

19A.3.6 Feedback of Operating, Design and Construction Experience

The following site-specific supplement addresses COL License Information Item 19.25.

Administrative procedures for evaluating operating, design and construction experience are included in STP 3&4 Project documents including, Engineering Technical Specifications, U7-PROJ-G-SPEC-ETS-0001, and Utility Requirements Document Requirements, U7-PROJ-G-RPT-URD-0001 to ensure and for ensuring that applicable important industry experiences shall be are provided in a timely manner to those designing and constructing the ABWR Standard Plant. (Subsection 19A-2.41). Operator experience will be incorporated into training and procedures prior to fuel load as described Sections 13.2.3 and 13.5.3, respectively. (COM 19A-1).

The COLA will be revised as shown below to incorporate additional information on the COL License Applicant Items in Appendix 19B.

19B.2.2 A-1: Water Hammer

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

South Texas Project Units 3 and 4 does not apply "Leak-Before-Break" analysis. Therefore the COL Applicant Item is not applicable.

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19B.2.12 A-36: Control of Heavy Loads Near Spent Fuel

STP DEP 1.1-2

Resolution

(6) The heavy load handling system is designed in accordance with relevant requirements of GDC 2, 4, and 61 and the guidance of References 19B.2.12-2, and 19B.2.12-5 through 19B.2.12-7. The ABWR design is for a single unit STP 3 & 4 is a dual-unit station. The Units do not share heavy load handling systems; therefore GDC 5 is satisfied not applicable (Subsections 9.1.5.1 and Section 3.1).

The following supplement is provided to address information required by the COL License Applicant in Appendix 198.

Update

STP DEP 1.1-2

The COL Applicant Items identified in Items (1) and (3) above are discussed in COLA Section 9.1.6.6. STP 3 & 4 is a dual-unit station. The Units do not share heavy load handling systems therefore GDC 5. Sharing of Structures, Systems, and Components, is satisfied.

19B.2.17 A-47; Safety Implications of Control Systems

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 198.

Update

The required testing, inspection and replacement guidance will be developed consistent with the plant operating procedure development plan described in Section 13.5. (COM 19B-2)

19B.2.27 C-1: Assurance of Continuous Long-Term Capability of Hermetic Seals on Instrumentation and Electrical Equipment

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 198.

Update

NUREG-0588 was considered in the design of the ABWR (Table 1.8-22). FSAR Section 3.11.6 discusses the Environmental Qualification program for STP Units 3 and 4.

19B.2.29 C-17: Interim Acceptance Criteria for Solidification Agents for Radioactive Solid Wastes Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

COLA Section 11:4.3 discusses compliance to 10CFR 61.56 and the Process Control Program for the solidification process.

19B.2.35 51: Proposed Requirements for Improving the Reliability of Open Cycle Service Water Systems

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

The information required from the COL Applicant is provided in Section 9.2.5.1 (Ultimate Heat Sink (UHS)), and Section 9.2.15 (Reactor Service Water (RSW)):

19B.2.38 75: Generic Implications of ATWS Events at Salem Nuclear Plant Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

The program for post-trip review of unscheduled reactor shutdowns, the program for post-maintenance operability testing, and the program for control of vendor related modifications, preventative maintenance and surveillance for reactor trip breakers are included in the programs discussed in Section 13.5.3.3.2.

19B.2.45 105: Interfacing Systems LOCA at BWRs

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

No longer listed in NUREG-0933. Therefore, not applicable to future reactor plants.

19B.2.49 120: On-Line Testability of Protection Systems Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

The Maintenance Rule Program for STP Units 3&4 is described in COLA Section 17.06S.

19B.2.55 145: ACTIONS TO REDUCE COMMON CAUSE FAILURES

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

The Maintenance Rule Program for STP Units 3&4 is described in COLA Section 17.06S.

19B.2.56 151: Reliability of Anticipated Transient Without Scram Recirculation Pump Trip (ATWSRPT) in BWRs Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 198.

Update

The Maintenance Rule Program for STP Units 3&4 is described in COLA Section 17.06S.

19B.2.57 153: Loss of Essential Service Water in Light-Water Reactors Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

The design of the RSW system is presented in STP 3&4 COLA, Section 9.2.15. The design of the Ultimate Heat Sink is presented in COLA Section 9.25, which includes measures to prevent flow blockage from ice formation. The RSW system and UHS system has been included in the site-specific PRA described in COLA Section 19. The Maintenance Rule Program for STP Units 3&4 is described in COLA Section 17.06S.

19B.2.60 A-29: Nuclear Power Plant Design for the Reduction of Vulnerability to Industrial Sabotage Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 19B.

Update

The ABWR design features enhancing resistance of the ABWR to sabotage have been confirmed to be present in the STP 3&4 design.

19B.2.68 II.E.6.1: Test Adequacy Study Issue

Resolution

The following supplement is provided to address information required by the COL License Applicant in Appendix 198.

Update

The In-service Inspection plan is included in the STP 3&4 COLA in Section 3.9.6. Generic Letter 89-10 requirements are discussed in Section 13.4S

19B.3 COL License Information

19B.3.1 COL Applicant Safety Issues

The following standard supplement addresses COL License Information Item 19.28

All Information in Appendix 19B that refers to COL Applicant is also addressed in FSAR 1.9S.

19B.3.2 Testing of Isolators

The following standard supplement addresses COL License Information Item 19.28a.

The inspection and test program for fiber optic-type isolators used between safety-related and non-safety-related systems and will be established consistent with the plant operating procedure development plan in Section 13.5. prior to fuel loading. If other types of isolators are used (those subject to electrical leakage due to maximum credible electrical faults), the required testing, inspection and replacement guidance will be developed consistent with the plant operating procedure development plan in Section 13.5. prior to fuel loading (COM 19B-1).

Summary of Commitment COM 19A-1

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COM 19A-1

Commitment	Description	Completion Date
COM 19A-1	Operator experience will be incorporated into training	Prior to fuel load
CR 07-14097	and procedures prior to fuel load as described Sections	
Action 2	13.2.3 and 13.5.3, respectively.	

Summary of Commitment COM 19B-2

COM 19B-2

Commitment	Description	Completion Date
COM 19B-2	The required testing, inspection and replacement	Prior to fuel load
CR 10-11424	guidance will be developed consistent with the plant	
Action 1	operating procedure development plan described in	
	Section 13.5. Generic Issue A-47.	