PMSTPCOL PEmails

From: Anand, Raj
Sent: Tuesday, October 13, 2009 11:33 AM
To: rhscheide@stpegs.com
Cc: Mookhoek, William; Tonacci, Mark; Wunder, George; Zhao, Jack; Taneja, Dinesh; Haider, Syed; Steingass, Timothy; Ray, Neil; STPCOL
Subject: STP Tier 2 Audit on October 27, 28, and 29, 2009
Attachments: Audit Plan for STP COLA Tier 2 Departures (OCT 26).doc

Hi Dick,
Enclosed is the audit plan to review selected Tier 2 departures related to STP Units 3 and 4 COLA. This audit is scheduled for October 27, 28, and 29, 2009 at Bay City, TX. The NRC staff plan to arrive at the STP Offices at 8.30 AM on Tuesday, October 27, 2009 as per proposed Agenda. This audit will be performed as per NRO Office Instruction NRO-REG-108. If you have any questions or comments, please contact me.
Thanks,
Raj

Raj Anand
Raj Anand
Project Manager
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From: Anand, Raj

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AUDIT PLAN TO REVIEW SELECTED TIER 2 DEPARTURES RELATED TO STPNOC UNITS 3 AND 4 COMBINED LICENSE FINAL SAFETY ANALYSIS REPORT CHAPTERS 7, 9 AND 10 FOR SAFETY EVALUATION REPORT

APPLICANT:	South Texas Project Nuclear Operating Company
APPLICANT CONTACT:	Scott Head Bill Mookhoek, et. al
TIME:	8:30 a.m. to 5:00 p.m. on October 27, 2009 to 8:30 a.m. to 5:00 p.m. on October 29, 2009
LOCATION:	South Texas Project Nuclear Operating Company Offices, Bay City, Texas
REVIEWERS:	Raj Anand (NRO/DNRL/NGE-2) Jack Y. Zhao (NRO/DE/ICE2) Dinesh Taneja (NRO/DE/ICE2) Syed Haider (NRO/DSRA/SBCV) Greg Makar (NRO/DE/CIB2) Tim Steingass(NRO/DE/CIB2)

BACKGROUND

On September 20, 2007 South Texas Project Nuclear Operating Company (STPNOC) submitted to the U.S. Nuclear Regulatory Commission (NRC), a Combined License Application (COLA) Final Safety Analysis Report (FSAR) to construct and operate two additional units (Units 3 and 4) based on the U.S. Advanced Boiling Water Reactor (ABWR) Certified Design Control Documents (DCD) at the South Texas Project Nuclear Power Plant (STPNPP) site located in the county of Matagorda near Bay City, Texas. Since then, the NRC staff has initiated a safety evaluation of the STPNOC Units 3 and 4 COLA.

A review of South Texas Project (STP) FSAR Chapter 7 and its Tier 2 Departures, Rev. 2 indicates that significant changes have been made to the instrumentation and control (I&C) systems in the certified ABWR DCD. FSAR Chapter 9 and its Tier 2 Departures indicates that the proposed modification to the Turbine Building (TB) ventilation system results in a change from the certified recirculation system to a once-through air-supply system. The compliance of the proposed design change with the NRC regulations for monitoring and controlling radioactive effluent releases from the TB needs to be established. Besides, the maximum air temperatures in the moisture separator compartment and steam tunnel area were increased from 49°C (120.2°F) to 60°C (140°F). It needs to be established that there is no adverse impact of such a high temperature on the qualification of any safety-related equipment/instrumentation or the

operator's safe entry and access to the areas. Tier 2 departures not requiring NRC approval for Chapters 3 and 10 are areas of interest for Component Integrity, Performance and Testing Branch (CIB2) staff. The staff seeks further technical detail of the STP evaluations performed for STP departures 10.2-1, 10.2-2, and 3.5-1.

The Departures Report indicates that the Tier 2 departures have been evaluated and determined to comply with the requirements of 10 CFR Part 52, Appendix A, Section VIII.B.5. The NRC staff intends to review the applicant's evaluation process to ensure that the process results in changes that are consistent with the requirements of 10 CFR Part 52, Appendix A, Section VIII.B.5.

PURPOSE AND APPROACH

The purpose of this audit is to review additional documents related to STPNOC's evaluations indicating that the departures in Chapters 7, 9, and 10 of the FSAR have been evaluated and determined to comply with the requirements of 10 CFR Part 52, Appendix A, Section VIII.B.5 given that the system design included in the original ABWR DCD was significantly changed. The Tier 2 departures to be audited are presented in Attachment B which is being provided to STPNOC.

To achieve the review goals in an efficient manner, the NRC staff will assemble an interdisciplinary audit team. To facilitate and expedite the auditing work, it is foreseen that the audit will be attended by representatives from STPNOC who will introduce the audit topics and provide supporting documents and technical evidence to the reviewers. The staff will document the audit findings in an audit report.

AUDIT ACTIVITIES AND SCHEDULE

The NRC staff will conduct the audit over a period of three business days. The NRC staff may request an ad-hoc extension of the audit at the same location if findings during the ongoing audit reveal the need for additional time. Such an extension will be requested before the meeting is adjourned on October 29, 2009 by the NRC staff responsible for the audit.

Following the audit, the NRC staff responsible for the audit will assemble and prepare a final audit report. The final report will be made available to all contributors for their concurrence. Any final notes by the contributors will be communicated to Raj Anand.

A proposed agenda for the audit is presented in Attachment A. A draft list of Tier 2 departures to be audited is presented in Attachment B. If necessary, any circumstances related to the conductance of the audit should be communicated to Raj Anand (NRC) at 301-415-1146 or at raj.anand@nrc.gov.

Attachment A

Proposed Agenda
NRC STP COLA Tier 2 Departures Audit
October 27-29, 2009
South Texas Project Nuclear Operating Company
Site, Bay City, Texas

Tuesday, October 27, 2009 Morning Session: AUDIT - Proprietary

8:30 a.m. -9:15 a.m.	Entrance / Introduction[NRC/STPNOC]
9:15 a.m. -12:00 p.m.	Site Tour of STPNOC planned construction areas of Units 3 & 4
12:00 p.m. -1:00 p.m.	Lunch

Afternoon Session: AUDIT - Proprietary

1:00 p.m. – 2:45 p.m.	NRC Audit of Available Documentation for Tier 2 Departures ..... [STPNOC]
2:45 p.m. -3:00 p.m.	Break
3:00 p.m. – 5:00 p.m.	NRC Audit of Available Documentation for Tier 2 Departures ..... [STPNOC]
5:00 p.m.	Adjourn

Wednesday, October 28, 2009 Morning Session: AUDIT - Proprietary

8:30 a.m. -10:00 p.m.	NRC Audit of Available Documentation for Tier 2 Departures ..... [NRC/STPNOC]
10:00 a.m. -10:15 a.m.	Break
10:15 a.m. -12:00p.m.	NRC Audit of Available Documentation for Tier 2 Departures [NRC/STPNOC]
12:00 p.m. -1:00 p.m.	Lunch

Afternoon Session: AUDIT - Proprietary

1:00 p.m. – 2:45 p.m.	NRC Audit of Available Documentation for Tier 2 Departures [NRC/STPNOC]
2:45 p.m. -3:00 p.m.	Break
3:00 p.m. – 5:00 p.m.	NRC Audit of Available Documentation for Tier 2 Departures [NRC/STPNOC]
5:00 p.m.	Adjourn

Thursday, October 29, 2009 Afternoon Session: AUDIT – Proprietary

8:30 a.m. -10:00 a.m. NRC Audit of Available Documentation for Tier 2 Departures.... [NRC/STPNOC]

10:00 a.m. -10:15 a.m. Break

10:15 a.m. -12:00 p.m. NRC Audit of Available Documentation for Tier 2 Departures.... [NRC/STPNOC]

12:00 p.m. -1:00 p.m. . Lunch

Afternoon Session: AUDIT - Proprietary

1:00 p.m. -2:45 p.m. NRC Audit of Available Documentation for Tier 2 Departures.... [NRC/STPNOC]

2:45 p.m. -3:00 p.m. Break

3:00 p.m. -5:00 p.m. Audit Summary and Next Steps ..... [NRC/STPNOC]

5:00 p.m. Adjourn/Exit

Attachment B

List of Tier 2 Departures for South Texas Project Site Audit for FSAR Chapters 7, 9 and 11

The following table represents a draft list of Tier 2 departures that the U. S. Nuclear Regulatory Commission staff plans to review during the site audit for the South Texas Project Units 3 and 4 Combined License Application Final Safety Analysis Report. Additional items or changes may be added to the existing list, based on discussion and review.

STP Departure No.	Description of Departure	Issue for Audit/Inspection	Tech Branch	Tech Reviewer	Chapter PM	Comments
STD DEP 7.2.2	Description of Scram Actuating Relays	Departure STD DEP 7.2-2, Description of Scram Actuating Relays and Section 7.2.1.1.4.1.(3) in the COLA FSAR proposed to change the normally closed relay contacts to normally open relay contacts for the scram logics. The above change would prevent the relay contacts to be closed to provide the protection function if the power supplies are not available. The staff needs to audit that STPNOC has compelling reasons for the change, and provide sufficient information for this change.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.2-6	RPS Instrumentation Ranges	Table 7.2-1 in COLA FSAR changed the drywell high pressure from 0-0.036 MpaG to -15.0 – 30.0 kPaG, but Table 7.5-2 in COLA FSAR does not show any change to the narrow range 0.034 – 0.021 MpaG, but the wide range has been changed from 0-100% to 0-110%. Sections 7.5.2.1.(2).(b) in both DCD and COLA FSAR list the narrow range as -34.32 to +34.32 kPaG. The process for various changes to the instrument ranges needs to be audited.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.3-4	ADS Logic	DEP 7.3-4, ADS Logic mentioned the “settings of less than or equal to 8 minutes for this timer which needs to be verified. The process for this departure needs to be audited.	I&C Branch	J. Zhao	A. Muniz	

STP Departure No.	Description of Departure	Issue for Audit/Inspection	Tech Branch	Tech Reviewer	Chapter PM	Comments
STD DEP 7.3-7	Automatic Depressurization System (ADS) Manual Operation"	Staff needs to audit if the normal manual switch is a hardwired or soft switch in the main control room, and if it's a soft switch, what protection features are to be implemented for this manual switch?	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.3-9	Shutdown Cooling Operation	The changes in this departure for the shutdown cooling operation system have impact on some other certified design documents. Since it's a Tier 2 departure, those changes to the certified documents do not require NRC's prior approval, however, the implementation of changes to the related design documents needs to be audited to make sure that the related changes are appropriately implemented.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.3-10	ESF Logic and Control System (ELCS) Mode Automation"	There are corresponding changes resulting from this departure to some certified interlock block diagrams (IBD) for the ESF logic and control system. Since it's a Tier 2 departure, those changes to the IBDs do not require NRC's prior approval, however, the implementation of the changes mentioned in this departure needs to be audited to make sure that the corresponding changes are appropriately implemented.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.3-13	Containment Spray Logic	There are many changes to the certified interlock block diagrams (IBD) related to this departure for the containment spray system. Staff needs to audit to make sure that the changes in this departure are correctly implemented on the certified IBDs.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.3-14	Residual Heat Removal Suppression Pool Cooling	The changes resulting from this departure will affect some certified interlock block diagrams (IBD) related to residual heat removal suppression pool cooling system. Implementation of the changes mentioned in this	I&C Branch	J. Zhao	A. Muniz	

STP Departure No.	Description of Departure	Issue for Audit/Inspection	Tech Branch	Tech Reviewer	Chapter PM	Comments
	Logic"	departure needs to be audited to make sure that the implementation of the changes is correctly conducted.				
STD DEP 7.6-1	Oscillation Power Range Monitor (OPRM) Logic	The design process for the OPRM logic needs to be audited since it's the first-of-a-kind engineering for the STP's EPC contractor. In addition, some original proprietary design documents for the OPRM which are not available to the EPC contractor need to be reconstituted.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 7.7-3	Feed water Turbidity	Departure STD DEP 7.7-3 states that "there is no practical manner in which to perform this measurement", which may not be accurate since the continuous on-line turbidity measurement is available. The process for this departure needs to be audited to verify its appropriateness.	I&C Branch	J. Zhao	A. Muniz	
STD DEP 9.4-9.	**Turbine Building HVAC System**	The proposed modification to the Turbine Building (TB) ventilation system would result in a change from the certified recirculation system to a once-through air-supply system. It is not clear whether the proposed design change has considered its impact on demonstrating compliance with NRC regulations for monitoring and controlling radioactive effluent releases from the TB. Specifically, the applicant is requested to confirm that the implementation of the design change will comply with Part 50 Appendix A, GDC 60 and 64 criteria; dose limit to members of the public under 10 CFR 20.1301 and 20.1302; and effluent concentration limits of Appendix B to 10 CFR Part 20 (Table 2, Column 1); and numerical guides and design objectives of Appendix I to 10 CFR Part 50.	Containment & Ventilation Branch (**SBCV)**	S. Haider	T. Tai	

STP Departure No.	Description of Departure	Issue for Audit/Inspection	Tech Branch	Tech Reviewer	Chapter PM	Comments
		The maximum air temperatures in the moisture separator compartment and steam tunnel area were increased from 49°C (120.2°F) to 60°C (140°F). Would such a high temperature affect the qualification of any safety-related equipment or instrumentation located in these areas, which could be adversely impacted. Would the operator's entry and access be safe into these 140°F environments?				
STP DEP 10.2-1	Steam & Power Conversion System	In Section 10.2.3.5 (Preservice Inspection) of the COL FSAR, the requirement to perform 100% volumetric (ultrasonic) examination of finished machined surfaces was eliminated as part of STP DEP 10.2-1. The FSER does not identify at what stage of processing the 100% volumetric examination would take place. Further, it does not identify the acceptance criteria and removal requirements for surface and subsurface indications and flaws.	Comp. Integrity & Testing Branch (CIB2)	G. Makar	T. Tai	
STP DEP 10.2-2	Steam & Power Conversion System	a) With respect to materials selection for large integral rotors in FSAR Section 10.2.3.1, the proposed values of fracture appearance transition temperature (FATT) and Charpy V-notch energy are different than those in SRP Section 10.2.3. For low-pressure turbine rotors, SRP 10.2.3 recommends a 50% FATT no higher than -18°C (0°F), and Charpy V-notch energy of at least 8.3 kg-m (60 ft-lbs) in the tangential direction at the minimum operating temperature of each low-pressure rotor. A minimum of three Cv specimens should be tested in accordance with specification ASTM A-370. As part of STP DEP 10.2-2, FSAR Section 10.2.3.1 states that the integral turbine rotor forgings will be required	Comp. Integrity & Testing Branch (CIB2)	G. Makar	T. Tai	

STP Departure No.	Description of Departure	Issue for Audit/Inspection	Tech Branch	Tech Reviewer	Chapter PM	Comments
		to show 50% FATT no higher than 40°F and have Charpy V-notch energy of 45 ft-lbs at the minimum operating temperature. b) Part of STP DEP 10.2-2 is a paragraph about future turbine designs at the end of FSAR Section 10.2.3.1 (Materials Selection). This paragraph appears to seek approval for a possible future change in the rotor design and materials properties without NRC review. c) FSAR Section 10.2.3.2 (Fracture Toughness) contains the following requirement as part of STP DEP 10.2-2: The ratio of material fracture toughness, K_{IC} (as derived from material tests on each major part or rotor) to the maximum tangential stress intensity at speeds from normal to design overspeed is a least 2 at minimum operating temperature. Although this requirement appears to be based on the SRP 10.2.3 acceptance criterion, it is unclear to the staff how the applicant's version was derived. This also applies to the final sentence in Section 10.2.3.2, which refers to the "above ratio of fracture toughness to stress intensity." The SRP 10.2.3 acceptance criterion states the ratio of fracture toughness to maximum tangential stress will be at least 2 $\sqrt{}$in (10 $\sqrt{}$mm) at minimum operating temperature. d) In FSAR Section 10.2.3.4 (Turbine Design), paragraph (3), STP DEP 10.2-2 changes paragraph (3) to limit the turbine rotor <u>average</u> tangential stress rather than <u>maximum</u> tangential stress to 0.75 of the minimum specified yield stress of the material. This				

STP Departure No.	Description of Departure	Issue for Audit/Inspection	Tech Branch	Tech Reviewer	Chapter PM	Comments
		change appears to allow a higher level of stress than the SRP guidance.				
STD DEP 3.5-1	Internally Generated Missiles	The subject departure changes the STP 3 & 4 Turbine generator placement and orientation in relation to essential systems of the adjoining unit from favorable to unfavorable. The staff requests an in-depth review of the process used and level of technical detail review under 10 CFR 52, Appendix A, Section VIII.B.5 for this departure.	Comp. Integrity & Testing Branch (CIB2)	T. Steingass	T. Tai	