

## PMSTPCOL PEmails

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**From:** Tai, Tom  
**Sent:** Monday, May 16, 2011 1:57 PM  
**To:** Price, John E  
**Cc:** STPCOL  
**Subject:** Draft May 23-27, 2011 Audit Plan  
**Attachments:** Seismic Audit Plan IOM 5-23-2011.doc

John,

Attached for your information is the audit plan for May 23-27, 2011. It is being typed by the secretary now.

I'll be in training both Wednesday and Thursday (5/18 and 5/19). I'll be in the office until 7:55 a.m. both days but I will not return until after 4:30 p.m. If you have any questions, please contact me before 8 a.m. or after 4:30 p.m.

Regards.

Tom Tai  
DNRL/NRO  
(301) 415-8484  
[Tom.Tai@NRC.GOV](mailto:Tom.Tai@NRC.GOV)

**Hearing Identifier:** SouthTexas34Public\_EX  
**Email Number:** 2788

**Mail Envelope Properties** (0A64B42AAA8FD4418CE1EB5240A6FED127675CFFC7)

**Subject:** Draft May 23-27, 2011 Audit Plan  
**Sent Date:** 5/16/2011 1:57:18 PM  
**Received Date:** 5/16/2011 1:57:20 PM  
**From:** Tai, Tom

**Created By:** Tom.Tai@nrc.gov

**Recipients:**  
"STPCOL" <STP.COL@nrc.gov>  
Tracking Status: None  
"Price, John E" <jeprice@STPEGS.COM>  
Tracking Status: None

**Post Office:** HQCLSTR02.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	460	5/16/2011 1:57:20 PM
Seismic Audit Plan IOM 5-23-2011.doc		79866

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

MEMORANDUM TO: Mark Tonacci, Chief  
BWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

FROM: Tom Tai, Senior Project Manager  
BWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

SUBJECT: MAY 23 - 27, 2011, AUDIT OF NUCLEAR INNOVATION NORTH  
AMERICA, LLC, COMBINED LICENSE APPLICATION SEISMIC  
DESIGN AND SUPPORTING ANALYSES

By letter dated September 24, 2008, South Texas Nuclear Operating Company (STPNOC, applicant) submitted Revision 2 of the South Texas Project (STP) Units 3 and 4 Combined License Application (COLA). The staff has identified a need to audit the seismic design and supporting analyses that support STP Units 3 and 4 COLA. The audit will take place at the Sargent and Lundy office in Chicago, Illinois from May 23 - 27, 2011. A copy of the audit plan is enclosed.

Docket Nos.: 52-012  
52-013

Enclosure:  
As stated

CONTACT: Tom Tai, NRO/DNRL  
301-415-8484

MEMORANDUM TO: Mark Tonacci, Chief  
BWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

FROM: Tom Tai, Senior Project Manager  
BWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

SUBJECT: MAY 23 - 27, 2011, AUDIT OF NUCLEAR INNOVATION NORTH AMERICA, LLC, COMBINED LICENSE APPLICATION SEISMIC DESIGN AND SUPPORTING ANALYSES

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Docket Nos.: 52-012  
52-013

Enclosure:  
As stated

CONTACT: Tom Tai, NRO/DNRL  
301-415-8484

DISTRIBUTION:

PUBLIC	MChakravorty, NRO	SChakrabarti, NRO
LPLI-1 R/F	MTonacci, NRO	KHawkins, NRO
BAbeywickrama, NRO	GWunder, NRO	TTai, NRO

**ADAMS Accession No: ML110670406**

**NRO-002**

OFFICE	DNRL/BWR/PM	DNRL/BWR /LA	DE/SEB2/TR	DE/SEB2 /BC	DNRL/BWR/PM
NAME	TTai	BAbeywickrama	SChakrabarti/ MChakravorty	KHawkins	GWunder
DATE					

**OFFICIAL RECORD COPY**

**AUDIT PLAN TO REVIEW SEISMIC DESIGN AND ANALYSES  
STP UNITS 3 AND 4 COMBINED LICENSE APPLICATION**

**APPLICANT:** Nuclear Innovation North America, LLC

**APPLICANT CONTACT:** Scott Head  
John Price  
Bill Mookhoek, et. al.

**DATE/TIME:** May 23 - 27, 2011  
8:30 a.m. - 5:00 p.m.

**LOCATION:** 55 E. Monroe St.  
Chicago, IL 60603

**REVIEWERS:** Kimberly Hawkins (NRO/DE/SEB2)  
Samir Chakrabarti (NRC/DE/SEB2)  
Manas Chakravorty (NRC/DE/SEB2)  
Mansour Tabatabaie (NRC Consultant)  
Peter Arnold (NRC Consultant)  
M. K. Ravindra (NRC Consultant)  
Basilio Sumodobila (NRC Consultant)

**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.

The NRC staff is reviewing the STP Units 3 and 4 combined license (COL) application that incorporates by reference the design certification for the Advanced Boiling Water Reactor (ABWR). Due to the number of open items and the need to perform a comprehensive review, the Structural Engineering Branch 2 (SEB2) proposes to conduct an audit in support of the review of Chapters 3.7 and 3.8. The NRC staff will perform the audit at the Sargent & Lundy office in Chicago, Illinois. The NRC staff will follow the guidance in NRO Office Instruction NRO-REG-108, "Regulatory Audits," in performing this audit.

Enclosure 1

## **PURPOSE AND APPROACH**

The purpose of this audit is to review analyses performed to support the seismic design and analyses for the STP Units 3 and 4 COL application. Some of these calculations are proprietary. Any significant findings during the audit will be documented in the audit report and requests for additional information may be issued for scheduled action.

## **AUDIT ACTIVITIES AND SCHEDULE**

The NRC staff will conduct the audit from May 23 - 27, 2011. The NRC staff may request an ad-hoc extension of the audit if deemed necessary. Such an extension will be requested before the meeting is adjourned on May 27, 2011 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.

The audit agenda is provided as Enclosure 2. Please contact Tom Tai at 301-415-8484 or at [Tom.Tai@NRC.GOV](mailto:Tom.Tai@NRC.GOV) if you have any questions related to the audit.

**Proposed Agenda  
U. S. Nuclear Regulatory Commission  
South Texas Project Combined License Application  
Seismic Analyses Audit  
May 23 - 27, 2011**

**Monday, May 23, 2011: AUDIT – Proprietary**

8:30 a.m. - 9:00 a.m.	Entrance/ Introduction	NRC/NINA
9:00 a.m. - 12:00 p.m.	Determination of Seismic Demand for Stability Evaluations RSW:  Piping Tunnel DGFOV (March Audit Issue 8) DGFOST  UHS Basin and Reactor Service Water Pump-house Structural Evaluation  Recap March audit items: design parameter table (3.8-7); friction coefficients (3.8-8); evaluation of soil bearing pressures (3.8-9); wind/hurricane/tornado loadings (3.8-11); beam shear (3.8-21); V&V SAFE (3.8-22); RSWT wave propagation (3.8-23 & 24); CBA stability calculation (3.8-25)	NRC
12:00 p.m. - 1:00 p.m.	Lunch	
1:00 p.m. - 4:30 p.m.	Determination of Seismic Demand for Stability Evaluations  I/I stability evaluation for all non-category I structures (RWB, CBA, TB, etc.) with potential to interact with seismic Category I structures (March Audit Issue 3)  UHS Basin and Reactor Service Water Pump-house Structural Evaluation  Post audit clarification issues #3, 4, 8, 10, and 12 to 17  Outstanding DGFOV issues (acceleration, amplification of vertical acceleration, static surcharge effects from adjacent buildings, stability evaluation)	NRC
4:30 p.m. - 5:00 p.m.	Summary for the Day and Actions	NRC/NINA

**Tuesday, May 24, 2011: AUDIT – Proprietary**

8:30 a.m. - 9:00 a.m.	Review Plan and Scope of the Day	NRC/NINA
9:00 a.m. - 12:00 p.m.	Effect of High Poisson's Ratio:	NRC

Effect of high Poisson's ratio on accuracy & stability of calculated transfer functions for seismic SSI analysis of UHS Basin/RSW Pump House (RAI 3.7.1-25)

UHS Basin and Reactor Service Water Pump-house Structural Evaluation

RAI responses received prior to May 17, 2011

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

Lunch

1:00 p.m. - 4:30 p.m.

V&V Issues:

NRC

- SASSI2000 V&V regarding the subtraction method (RAI 3.7.2-29 and Audit Issues 6)
- SASSI 2000 V&V regarding aspect ratio of shell elements (RAI 3.7.2-29 and Audit Issues 7)
- Software V&V for time history generation

UHS Basin and Reactor Service Water Pump-house Structural Evaluation

Radwaste Building design and stability evaluation

4:30 p.m. - 5:00 p.m.

Summary for the Day and Actions

NRC/NINA

**Wednesday, May 25, 2011: AUDIT – Proprietary**

8:30 a.m. - 9:00 a.m.

Review Plan and Scope of the Day

NRC/NINA

9:00 a.m. - 12:00 p.m.

Previous Audit Items:

NRC

- SSE damping for the cracked concrete model of RSW Piping Tunnel (RAI 3.7.1-22)
- Justification for analyzing empty fuel tank and soil separation cases for UB soil case only for DGFOV (RAI 3.7.1-27)
- Justification for analyzing empty basin and soil separation cases for UB soil case only for UHSB/RSWPH

UHS Basin and Reactor Service Water Pump-house Structural Evaluation

Design of other II/I structures (TB, SB, CBA) and safety factor reported in FSAR Table 3H.6-14

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

Lunch

1:00 p.m. - 4:30 p.m.

UHS Basin and Reactor Service Water Pump-house Structural Evaluation

NRC

Design of other II/I structures (TB, SB, CBA) and safety factor reported in FSAR Table 3H.6-14

4:30 p.m. - 5:00 p.m. Summary for the Day and Actions NRC/NINA

**Thursday, May 26, 2011: AUDIT – Proprietary**

8:30 a.m. - 9:00 a.m. Review Plan and Scope of the Day NRC/NINA

9:00 a.m. - 12:00 p.m. Previous Audit Items (Cont'd): NRC

- Seismic soil pressures on UHSB/RSWPH below-grade walls
- Local response amplifications and design of UHS Basin submerged columns due to hydrodynamic effects (3.7.2-28)
- 2-D SSSI analysis of (RWB+RSWT+RB) and (UHSB/RSWPH+RSWT+DGFOV-1C+RB) using UB backfill (Audit Issue 2)
- Reconciliation of the impact of using a lower ground water elevation in the SSI analysis (Audit Issue 1)
- Revised specification for DGFOV tank rigidity requirements
- Any other outstanding items from March audit

Design of DGFOV (seismic input from SSI, seismic and wind and tornado loadings, flood protection, seismic wave propagation effects, seismic gasp, and stability evaluation)

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

1:00 p.m. - 4:30 p.m. Design of DGFOV (seismic input from SSI, seismic and wind and tornado loadings, flood protection, seismic wave propagation effects, seismic gasp, and stability evaluation) NRC

4:30 p.m. - 5:00 p.m. Summary for the Day and Actions NRC/NINA

**Friday, May 27, 2011: AUDIT – Proprietary**

8:30 a.m. - 9:00 a.m. Review Plan and Scope of the Day NRC/NINA

9:00 a.m. - 11:00 p.m. Finalize audit findings and complete any unfinished items. NRC

11:00 a.m. - 12:00 p.m. NRC Caucus NRC

12:00 p.m. – 1:00 p.m. Lunch

1:00 p.m. – 2:00 p.m. Exit Meeting NRC/NINA

