

May 19, 2011

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

/RA/

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

By letter dated September 20, 2007, STP Nuclear Operating Company (STPNOC) submitted a combined license application (COLA) for two new units designated South Texas Project (STP) Units 3 and 4 (STP 3 and 4). On January 24, 2011, Nuclear Innovation North America (NINA) became the primary applicant for the license for these two units. 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

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FROM: Tom Tai, Senior Project Manager
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NRO-002

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DATE	05/17/2011	05/19/2011	05/17/2011	05/17/2011	05/17/2011

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**AUDIT PLAN TO REVIEW SEISMIC DESIGN AND ANALYSES
SOUTH TEXAS PROJECT 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 January 20, 2007 STP 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, South Texas Project (STP), 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 site located in the County of Matagorda near Bay City, Texas. On January 24, 2011, Nuclear Innovation North America (NINA) became the primary applicant for the license for these two units.

The NRC staff is reviewing the STP Units 3 and 4 combined license (COL) application that incorporates by reference the design certification for the 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 Office of New Reactors (NRO) Office Instruction NRO-REG-108, "Regulatory Audits," in performing this audit.

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 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.	<p>3.7 - Determination of Seismic Demand for Stability Evaluations RSW:</p> <p>3.7 - Piping Tunnel DGFOSV (March Audit Issue 8) DGFOST</p> <p>3.8 - UHS Basin and Reactor Service Water Pump-house Structural Evaluation</p> <p>3.8 - 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)</p>	NRC
12:00 p.m. - 1:00 p.m.	Lunch	
1:00 p.m. - 4:30 p.m.	<p>3.7 - Determination of Seismic Demand for Stability Evaluations</p> <p>3.7 - III 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)</p> <p>3.8 - UHS Basin and Reactor Service Water Pump-house Structural Evaluation</p> <p>3.8 - Post audit clarification issues #3, 4, 8, 10, and 12 to 17</p> <p>3.8 - Outstanding DGFOSV issues (acceleration, amplification of vertical acceleration, static surcharge effects from adjacent buildings, stability evaluation)</p>	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: 3.7 - 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) 3.8 - UHS Basin and Reactor Service Water Pump-house Structural Evaluation 3.7/3.8 - RAI responses received prior to May 17, 2011	NRC
12:00 p.m. - 1:00 p.m.	Lunch	
1:00 p.m. - 4:30 p.m.	3.7 - V&V Issues: <ul style="list-style-type: none">• 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 3.8 - UHS Basin and Reactor Service Water Pump-house Structural Evaluation 3.8 - Radwaste Building design and stability evaluation	NRC
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.	3.7/3.8 - Previous Audit Items: <ul style="list-style-type: none">• 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 3.8 - UHS Basin and Reactor Service Water Pump-house Structural Evaluation 3.8 - Design of other II/I structures (TB, SB, CBA) and safety factor reported in FSAR Table 3H.6-14	NRC
12:00 p.m. - 1:00 p.m.	Lunch	

1:00 p.m. - 4:30 p.m.	3.8 - UHS Basin and Reactor Service Water Pump-house Structural Evaluation	NRC
	3.8 - Design of other III 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.	3.7/3.8 - Previous Audit Items (Cont'd):	NRC
	<ul style="list-style-type: none"> • 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 	
	3.8 - 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.	3.8 - 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

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ORIGINATOR: T. Tai

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

SECRETARY: C. Nagel

DATE: May 20, 2011

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