

August 27, 2012

Mr. Mark McBurnett, Senior Vice President
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Nuclear Innovation North America, LLC
4000 Avenue F
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SUBJECT: REGULATORY AUDIT SUMMARY OF SOUTH TEXAS PROJECT, UNITS 3
AND 4 COMBINED LICENSE APPLICATION - JULY 23 – 24, 2012
STRUCTURAL ANALYSES

Dear Mr. McBurnett:

By letter dated September 20, 2007, STP Nuclear Operating Company submitted to the U.S. Nuclear Regulatory Commission (NRC) a combined license (COL) application to construct and operate two reactor units (Units 3 and 4) based on the U.S. Advanced Boiling-Water Reactor (ABWR) Design Certification at the South Texas Project Nuclear Power Plant. On January 24, 2011, Nuclear Innovation North America (NINA) became the primary applicant for the license for these two units. The NRC Office of New Reactors (NRO) is reviewing the South Texas Project (STP) Units 3 and 4 COL application that incorporates by reference the ABWR Design Control Document. As part of this review, the NRO Structural Engineering Branch 2 conducted an audit of the documentation supporting Chapters 3.7 and 3.8 RAI responses and the hurricane wind design of the STP COL application. The audit was conducted at the Sargent & Lundy office in Chicago, Illinois, from July 23 - July 24, 2012. The NRC staff followed the guidance in NRO Office Instruction NRO-REG-108, "Regulatory Audits," in performing this audit. Enclosure 1 is a list of the NRC staff and NINA team participating in the audit. Enclosure 2 is the detailed results of the audit.

Please contact Tom Tai at (301) 415-8484 or Tom.Tai@nrc.gov if you have any questions related to the audit.

Sincerely,

/RA/

Ronaldo Jenkins, Branch Chief
LB3 Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Docket Nos.: 52-012
52-013

cc: See next page

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ADAMS ACCESSION NO.: ML12229A301

NRO-002

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DATE	08/22/2012	08/16/2012	08/21/2012	08/27/2012

OFFICIAL RECORD COPY

Letter to M. McBurnett from Ronaldo Jenkins dated August 27, 2012.

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ENCLOSURE 1

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REGULATORY AUDIT OF SOUTH TEXAS PROJECT, UNITS 3 AND 4 COMBINED LICENSE
APPLICATION – STRUCTURAL ANALYSES
JULY 23 – 24, 2012**

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DETAILED AUDIT RESULTS FOR HURRICANE WIND ANALYSES
July 23 – 24, 2012

1. Introduction

By letter dated September 20, 2007, STP Nuclear Operating Company submitted to the U.S. Nuclear Regulatory Commission (NRC) a combined license (COL) application to construct and operate two reactor units (Units 3 and 4) based on the U.S. Advanced Boiling Water Reactor (ABWR) Design Certification at the South Texas Project Nuclear Power Plant. On January 24, 2011, Nuclear Innovation North America (NINA) became the primary applicant for the license for these two units. The NRC Office of New Reactors (NRO) is reviewing the South Texas Project (STP) Units 3 and 4 COL application that incorporates by reference the ABWR Design Control Document. As part of this review, the NRO Structural Engineering Branch 2 conducted an audit of the documentation supporting Chapters 3.7 and 3.8 RAI responses and the hurricane wind design of the STP COL application. The audit was conducted at the Sargent & Lundy office in Chicago, Illinois, from July 23 to July 24, 2012.

Representatives from the NRC, key technical personnel representing STP Units 3 and 4, Toshiba America Nuclear Energy, and Sargent & Lundy (S&L) were present during the audit.

The NRC staff followed the guidance in NRO Office Instruction NRO-REG-108, "Regulatory Audits," in performing this audit.

2. Objectives and Approach

The purpose of this audit is to review the structural design calculations for hurricane evaluation and supporting documents in various RAI responses in Chapters 3.7 and 3.8.

It is the intent of both the applicant and staff that all open issues associated with Chapters 3.7 and 3.8 will be clarified and resolved to finalize the safety evaluation reports (SER).

3. Technical Review

Based on staff's review of the analyses completed by S&L, the following is a list of analyses reviewed during the audit:

1. STP Calc. 25425-000-HOC-HXYN-00005 (7 pages –Hurricane wind speed parameters)- prepared by Bechtel, Approved 2/12/2012
2. STP Calc. No. U7-STE-S-CALC-DESN-6004, Revision A, "Evaluation for Design Basis Hurricane Loads"

(I) STP Calc. 25425-000-HOC-HXYN-00005

This document was reviewed to verify hurricane parameters

Hurricane wind speed:

In section E of this document, it is stated that 'wind speed for the STP 3&4 can be estimated to be 210 mph with an accuracy of approximately plus or minus 5 miles per hour. The staff questioned in the February 2012 audit if the licensee had accounted for the inaccuracy in the estimation of the wind speed and used 210 MPH as wind parameter instead of 215 MPH. (an increase of 2.4%)

NINA/S&L staff informed staff that the hurricane missile velocities are computed based on 210 MPH wind speed. This wind speed was estimated by interpolating isotach data. The STP site is bounded by the estimated 210 mph isotach. Therefore, the hurricane wind speed of 210 mph is reasonable. The Bechtel calculation has been revised to reflect this logic and this issue is closed.

(II) STP Calc No. U7-STE-S-CALC-DESN-6004, Revision A

Staff reviewed STP calculation no. U7-STE-S-CALC-DESN-6004, Revision A that supports the evaluation summary data in Tables 3H.11-1 through 3H.11-3, 'Hurricane Missile Impact Evaluation'. The staff's review of the calculation confirmed that in all cases, a peak triangular pulse load of 1024 Kips in horizontal direction and 445K in vertical direction was applied. The triangular pulse duration of 0.10 sec. was used. The dynamic load factor was limited to 1.0 or greater than 1.0. The staff found instances for structures smaller than the automobile footprint (e.g., Table 3H.11-3), where 1024K load is not used for auto missile impact evaluation. In such cases, the applied peak impact load was scaled appropriately in proportion with the width of the structure.

(III) Hurricane Auto Missile Evaluation

Staff audited NINA's methodologies for hurricane auto missile impact evaluation for the reactor building (RB), control building (CB), and reactor service water (RSW) piping tunnel including local and global damage assessment.

The staff needs additional information that confirms the assumptions NINA had made for the panel assessment of RB and CB for hurricane auto missile. NINA had concluded that RB and CB panel size are 'bounded' by the DGFOV and DGFOT panel sizes or exceed them. During the audit, NINA presented methodologies for the local and global damage assessment of the RB, CB, and RSW piping tunnel due to hurricane auto missile impact load. The staff finds that the general methodologies are acceptable. The staff could not verify the adequacy of the RB or CB panel for hurricane auto missile impact load because specific calculations were not available. The staff needs to review supporting calculations to confirm the adequacy of the RB or CB panels. NINA committed to provide calculations for RB and CB bounding panels.

(IV) RAI Responses

In addition to reviewing pertaining hurricane-wind-related analyses, the staff also participated in presentations by S&L which provided supporting information on RAI

responses described in the audit plan items. There is no technical challenge but NINA will take actions described in Section 4 below for clarification purposes.

On the basis of the review performed, it is determined that the evaluation for hurricane effects for the STP units 3 and 4 is reasonable pending a satisfactory resolution of items described in Section 4 below.

4. Audit Findings

There is no audit finding or observations. NINA/S&L committed to the following actions, which include additional analysis and updating the FSAR:

With respect to hurricane wind issues, S&L will:

1. Revise the COL FSAR to clarify that the 1,024 kip load is the peak of the triangular impact load for the automobile impact in the horizontal direction and 445 kip is the peak of the vertical direction.
2. Revise/supplement the RAI response (02.03.01-24) that DLF is always equal or greater than 1.
3. Evaluate the east wall panel of the CB between elevations (EL) 50'-11" and 67'-3/4" and the RB between EL 54'-1/2" and 71'-9" for automobile impact due to hurricane.

With respect to the RAI responses in the audit plan, NINA will:

1. Include in the COL FSAR a discussion of foundation soil springs, spring values, and reason for using uniform soil spring for the RWB SAP2000 model.
2. Include the basis for selection of anchor bolt material for RWB.
3. Provide basis for using no load for wall attachments in the structural design in an RAI response.
4. Provide in the COL FSAR additional explanation for simultaneous consideration of sliding and overturning about two horizontal axes.
5. Revise COL FSAR Figure 3H.6-137 to remove reference to UHS figures.
6. Revise COL FSAR Figure 3H.6-48 to -50 to show passive soil pressures needed for stability.
7. Revise response to 03.08.04-23 to explain why lower bound spring values are selected for use.
8. Revise the construction sequence COLA mark-up to address above UHS basemat level and to clarify the buried tunnels construction sequence, where the tunnels will be constructed in segments, to demonstrate that the sequence may not subject the tunnels to additional stresses that may adversely impact the tunnel design.

5. Conclusion

The tentative schedule to provide draft responses and feedback to staff is mid-August and to finalize all input by the end of August 2012. There is no technical issue identified in this audit. The actions summarized above were agreed to by NINA and S&L management during the exit. The staff agreed to resume the weekly open item call for schedule and status update.