September 27, 2011

Mr. Scott Head, Manager
Regulatory Affairs
Nuclear Innovation North America, LLC
4000 Avenue F
Bay City, TX 77414

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 386 RELATED TO SRP SECTION 03.07.01 FOR THE SOUTH TEXAS PROJECT COMBINED LICENSE APPLICATION

Dear Mr. Head:

By letter dated September 20, 2007, STP Nuclear Operating Company (STP) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, I can be reached at 301-415-8484 or by e-mail at Tom.Tai@nrc.gov or you may contact George Wunder at 301-415-1494 or George.Wunder@nrc.gov.

Sincerely,

/RA George F. Wunder for:/

Tom M. Tai, Senior Project Manager
ABWR Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-012
52-013

eRAI Tracking No. 6050

Enclosure:
Request for Additional Information

cc: William Mookhoek
John Price
Loree Elton

If you have any questions or comments concerning this matter, I can be reached at 301-415-8484 or by e-mail at Tom.Tai@nrc.gov or you may contact George Wunder at 301-415-1494 or George.Wunder@nrc.gov.

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Tom M. Tai, Senior Project Manager
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Office of New Reactors

Docket Nos. 52-012
52-013

eRAI Tracking No. 6042

Enclosure:
Request for Additional Information

cc: William Mookhoek
John Price
Loree Elton

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NAME	SChakrabarti	BThomas	TTai	MSpencer	GWunder
DATE	9/9/11	9/21/11	9/21/11	9/26/11	9/26/11

***Approval captured electronically in the electronic RAI system.**

OFFICIAL RECORD COPY

Request for Additional Information No. 6050 Revision 6

9/26/2011

South Texas Project Units 3 and 4
South Texas Project Nuclear Operating Co
Docket No. 52-012 and 52-013
SRP Section: 03.07.01 - Seismic Design Parameters
Application Section: FSAR 3.7.1

QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)

03.07.01-30

The Defense Nuclear Facilities Safety Board (DNFSB) has identified a technical issue in SASSI that when subtraction method is used to analyze embedded structures, the results may be non-conservative. Consequently, the staff issued RAI 03.07.01-29 requesting NINA to demonstrate acceptability of the STP design and analyses completed using SASSI subtraction method to meet the requirements of 10 CFR 50 Appendix S. On July 27 and 28, 2011, an audit was conducted at the Sargent & Lundy (S&L) office in Chicago, Illinois, to discuss the status and results of the evaluation performed in support of responding to RAI 03.07.01-29. Based on this audit, the staff has identified additional concerns on the evaluation performed by the applicant. As such, the applicant is requested to address and clarify the following issues:

1. Demonstrate that the amplified seismic input **(i.e., amplified input spectra due to presence of the nearby heavy structures)**, if generated by using the Subtraction Method (SM) for DGFOT, RSWPT, DGFOSV, and any other structures as applicable would be conservative as compared to those obtained using the Modified Subtraction Method (MSM) or the Direct Method (DM). Alternatively, the applicant may use amplified spectra derived from the use of MSM or the DM.

2. While SSI soil pressures obtained using both the SM and the MSM were in general comparable (See Figure 4.13 of July 27 & 28 audit presentation, SASSI Issues Raised by the DNFSB Letter to DOE), the results, presented at July 27, audit, did not fully demonstrate acceptability of the soil pressure distribution obtained from either the MSM or SM in comparison to results obtained from the DM. STP's project specific confirmation of the MSM method (using CB SSI analysis) or the SSSI analysis performed for one model (consisting of RWB, RSW Tunnel, and RB) did not include any comparison of the transfer functions of the soil pressure parameter at the interaction nodes at the exterior walls and the interacting adjacent building walls. The applicant is requested to further demonstrate that the soil-pressure distribution obtained from the SM or MSM method is acceptable and is conservative for use in seismic design.

3. For SSSI analysis (for soil pressure determination considering interaction of adjacent building), only one model (consisting of RWB, RSW Tunnel, and RB) was evaluated using the DM, SM, and MSM. STP has completed the analysis only for the lower bound soil case (UB case using backfill will also be performed). Preliminary results indicate that absolute soil pressure profile obtained from SM and MSM in some instances (particularly for exterior walls) did not compare well with those obtained from the DM. However, maximum total wall force (obtained from the TH analysis) due to soil pressure in general is within 5% for all three methods (Table 5.1 of July 27 & 28 audit presentation, SASSI Issues Raised by the DNFSB

Letter to DOE). Based on this analysis, STP preliminarily concluded that the total soil pressure on the embedded wall obtained from SM is acceptable. However, the applicant is requested to further clarify the entries (including how they were computed) as presented in Table 5.1 provided by STP at July 27 Audit.

4. The applicant is requested to reassess the seismic demand for stability evaluation of any applicable Category I and II/I structures in light of the DNFSB issue and confirm acceptability of the factors of safety against stability during an SSE.

5. The applicant is requested to review all the Punch List Items and any applicable RAI responses to determine if any of the responses previously provided should be revised as a result of the assessment performed for addressing DNFSB issues.

6. The issue of zero SSSI pressure on portions of the RSWPH North wall (Figure 3H.6-219, letter U7-C-NINA-NRC-110096) was further discussed with STP at July 27, 2011 meeting. It was indicated that there is a gap at these locations between the RSWPT south wall and the RSWPH north wall filled by the compressible material. However, for better clarity and understanding of the analysis model, STP is requested to provide an engineering sketch showing typical sections between the RSWPT and RSWPH including the tunnel entries to the RSWPH.

   In addition it was noted that Section 7 of Figure 1 (see seismic soil pressure handout of July 27 & 28, 2011 meeting) was cut through RSWPH north wall, inter space between the tunnel entries to the RSWPH north wall, RSW tunnel cross section, and other buildings. However Figure 3H.6-211 (see letter U7-C-NINA-NRC-110042 - 2D SSSI model of RSWPH, RSWPT, DGFOSVs, and RB) indicates that the actual SSSI model section has been cut through the tunnel entries to the RSWPH instead of the inter space between the tunnel entries as depicted in Section 7. While the SSSI model analyzed appears to be consistent with the soil pressure shown in Figure 3H.6-219, the resulting SSSI pressure may not conservatively represent the interaction pressure that could develop on the RSWPH North wall and RSWPT south wall through interaction of soil in the space enclosed by the tunnel entries, RSWPH North wall, and RSWPT south wall. The applicant is requested to address this issue and demonstrate that SSSI interaction pressure used for design is still conservative.