PMSTPCOL PEmails

From: Tai, Tom
Sent: Monday, May 09, 2011 1:28 PM
To: Price, John E
Cc: STPCOL; Eudy, Michael
Subject: STP - Feedback on Recent RAI responses
Attachments: Questions for conf call Revised (5-9-2011).doc

John,

Attached for your information is a revised list of comments on recent RAI responses. I sent you a draft last week and this one has additional items. As for your comment on Items 7 and 8 last week, we need to discuss in more detail during this Wednesday's telephone conference.

Regards

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Email Number: 2773

Mail Envelope Properties (0A64B42AAA8FD4418CE1EB5240A6FED126A41F42BC)

Subject: STP - Feedback on Recent RAI responses
Sent Date: 5/9/2011 1:28:02 PM
Received Date: 5/9/2011 1:28:03 PM
From: Tai, Tom

Created By: Tom.Tai@nrc.gov

Recipients:
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Files	**Size**	**Date & Time**
MESSAGE	380	5/9/2011 1:28:03 PM
Questions for conf call Revised (5-9-2011).doc	42490	

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

A. Preliminary Assessment of STP/NINA responses 110143 and up

RAI 03.08.04-18, Revision 1, Supplement 2

1. Design and Analysis (3H.3.5.1 & 2)

These sections describe the seismic and structural analysis of the RW/B, whereby the seismic response accelerations are obtained from a fixed base stick model subjected to a 0.15 RG 1.60 input ground motion spectrum. These accelerations subsequently are applied to a refined 3D SAP FE model. The applicant is requested to explain why using a fixed base model was considered adequate. Furthermore, it is not clear what type of SAP analysis was performed and how the results from the seismic stick model analysis were applied to the 3D finite element model. Clarification should be given as to how local amplification effects, i.e. of slabs and walls are considered in the design. In a previous response the applicant stated that the influence of nearby heavy buildings, i.e. R/B, on the seismic input motion was considered. The applicant is requested to include in the FSAR how the effect of the adjacent R/B was considered in the input motion for the RW/B, and to include the input ground spectra for the appropriate damping used in design of the RW/B.

FSAR Table 3H.3-1 provides vertical accelerations for the RWB at three floor elevations. It is not clear why horizontal accelerations are not included in the FSAR. Please include the horizontal accelerations for the RWB in the FSAR.

2. II/I Analysis and design (3H.3.5.3)

FSAR Section 3H.3.5.3 states that for II/I design, the structure is conservatively designed to remain elastic. The earthquake input used at the foundation level is the envelope of 0.3g RG 1.60 response spectrum and the induced acceleration response spectrum due to site-specific SSE. However, the FSAR does not describe how the seismic analysis and design is performed using the seismic input motion. Please describe in the FSAR how seismic analysis and design is performed for the RWB for II/I design.

3. Load Combination for Shear (Steel) (3H.3.4.3.4.2)

FSAR Section 3H.3.4.3.4.2 provides load combinations for structural steel design for RWB. The sixth load combination has a stress coefficient of 1.6. According to ANSI/AISC N690-1994 (R2004), Supplement 2, Table Q1.5.7.1, Note g, the stress limit coefficient in shear shall not exceed 1.4 in members and bolts. The applicant is requested to note the above limitation in the FSAR.

4. Ultimate soil bearing capacity (3H.3.4.2.1)

This section shows static and dynamic ultimate soil bearing capacities for the RW/B. The applicant is requested to state in the FSAR how these values were derived.

5. Tornado Parameters (3H.3.B & 3H.3.4.3.3.1)

These sections show different parameters to define tornado loads which depend on the design goal. The Design Information Table provided at the Mar 2011 Audit Meeting differs from the definitions in the FSAR text and provides specific design parameters for three different situations: main design of the structure, stability analysis and II/I design. The applicant is requested to reconcile the information in the FSAR text with the contents of the Design Information Table, and to make reference to the table if it should be incorporated in the FSAR.

6. Flood Design (3H.3.4.2.3)

This section defines the DBF as 33 ft MSL and is taken to correspond to the DCD design parameter for flooding (one ft below grade). The Design Information Table differs from the definitions in the FSAR text and provides specific design parameters for three different situations: main design of the structure, stability analysis and II/I design. The applicant is requested to reconcile the information in the FSAR text with the contents of the Design Information Table, and to make reference to the table if it should be incorporated in the FSAR.

RAI 03.08.04-30, Supplement 1

7. Extreme wind and tornado loading (3H.6.4.3.2)

In its response to this RAI the applicant uses Criterion 4 of SRP 3.3.1 to justify 50 year wind velocity in the wind pressure equation. However the staff notes that Criterion 4 just means that using table C6-7 of ASCE 7 is acceptable to convert 50 year into 100 year MRI and does not refer to the importance factor, and that therefore the procedure is not consistent with SRP 3.3.1, which requires a 100 year wind in addition to the importance factor of 1.15. This approach was also confirmed during the review of FSAR section 3.3.1. In light of recorded hurricane velocities exceeding 134 mph at the site, the staff needs to further evaluate this deviation from the SRP requirements. The staff also noted that the SRP 3.3.2 design requirements are met for tornado loadings (including the importance factor of 1.15), and that the tornado design thus follows the SRP recommendations.

RAI 03.08.04-35

8. Foundation bearing pressures reconciliation

In its response to this RAI the applicant states that the slab edges have to be fixed in order to perform the verification analysis. The applicant is requested to explain this approach, especially if boundary conditions which do not reflect real conditions are going to be introduced in the analysis. All possible load eccentricities (plus / minus components) need to be verified. Justification is needed to base the verification on only one load combination (with the lowest safety factor)

RAI 03.08.04-19, Supplement 1

9. Coefficient of Friction

In its response RAI 03.08.04-19, Supplement 1, dated April 25, 2011, the applicant addressed the issue of coefficient of friction raised in audit item 3.8-8. The applicant revised the site-specific ITAAC to require the waterproofing membrane to have a

minimum static coefficient of friction of 0.75, and also provided a Table that specifies that the concrete to concrete interface joints will be intentionally roughened to have a minimum static coefficient of friction of 0.75. However, the applicant did not explain how the specified minimum static coefficient of friction at the various interfaces, specifically at the waterproofing membrane, was compared with the dynamic coefficient of friction of 0.47 assumed for soil, and considered acceptable. Also, the requirement of intentionally roughening the concrete surface should be included in the FSAR.

B. Miscellaneous Questions from Audit and Reviewers Guide

1. FSAR Section 3H.6.4.3.3.3 refers to Figure 3H.6-44 and Figures 3H.6-245 through 3H.6-247 for lateral soil pressure for design of RSW Piping Tunnels. It is not clear why Figures 3H.6-212 through 3H.6-217, which provides lateral soil pressure on RSW Tunnels considering effects from adjacent RB and RWB, are not included here.

2. Figure 3H.6-44 in the Reviewer's Guide did not include the coordinate axes.

3. Figures 3H.6-138 and 139 are not clear, and, at least, the ZPA values should be annotated in the Figures.

4. Please describe if static surcharge pressures from adjacent buildings were considered in design.

5. For clarity, Figure 3H.6-137 should be appropriately annotated regarding its applicability.

6. Please clarify if the design table provided to us is going to be included in the FSAR. Because of the complexity of the various loadings used for the same building for various types of analysis, it is strongly recommended that this table be included in the FSAR.