PMSTPCOL PEmails

From: Tai, Tom
Sent: Wednesday, May 04, 2011 8:41 AM
To: Price, John E
Cc: STPCOL; Hawkins, Kimberly; Chakrabarti, Samir; Chakravorty, Manas
Subject: Questions for conf call 05_04_11 R1.doc
Attachments: Questions for conf call 05_04_11 R1.doc

John,

Attached are preliminary assessment on some of the recent responses in NINA letters 110043 and 110050.

If possible, we can discuss these tomorrow.

Regards

Tom Tai
(301) 415-8484

Hearing Identifier: SouthTexas34Public_EX
Email Number: 2769

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From: Tai, Tom

Created By: Tom.Tai@nrc.gov

Recipients:
"STPCOL" <STP.COL@nrc.gov>
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A. Preliminary Assessment of STP/NINA responses 03.08.04-18 R 1 S2, 03.08.04-30 S1, and 03.08.04-35

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 justify the validity of using a fixed base model, and to describe the design parameters, i.e. damping values used with load cases E' and Eo. 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 will be considered. The applicant is therefore 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 that these values were derived based on the same procedures and soil data that led to the corresponding values for Cat I buildings presented in Tables 2.5S.4-41.

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. The predominant design goal is to protect the nearby Cat I buildings from being damaged by a failure of the RW/B, therefore the same design tornado parameters for Cat I buildings are proposed for the II/I design. As stability is a main concern, the applicant is requested to clarify why the stability analysis proposed in the table is performed for a less stringent tornado definition.

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. The predominant design goal is to protect the nearby Cat I buildings from being damaged by a failure of the RW/B, therefore the same design flood parameters for Cat I buildings are proposed for the II/I design. As stability is a main concern, the applicant is requested to clarify why the stability analysis proposed in the table is performed for a less stringent flood definition.

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)