## Malave, Yanely

**From:** Malave, Yanely
**Sent:** Thursday, August 22, 2013 11:25 AM
**To:** Poslusny, Chester (cposlusny@babcock.com)
**Subject:** RVT Topical Report Discussion on September 3, 2013
**Attachments:** Comments on RVT Topical Report.docx

Good Morning Chet

In preparation for the planned call on Tuesday, September 3, 2013, between the NRC and Generation mPower to discuss the acceptance of the RVT Topical Report, find attached the technical staff's comments of on areas that supplemental information is needed to conduct a safety review. This email and its attachment will be made public through the NRC ADAMS system consistent with NRC policy.

Thanks

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**Comments on B&W mPower Topical Report, "Implementation of Random Vibration Theory (RVT) for Seismic Soil-Structure Interaction"**
**Report No. 11111-000-30R-K01G-00002**

The NRC staff has determined that the following information should be provided to conduct a safety review.

1. Theoretical formulation provided in Chapter 4 needs additional details regarding the derivation of the formulas including the assumptions used in the derivation. For specific formulas (Equations 4, 5, and 7) while the applicable references were cited, the Topical Report (TR) should include the details on how the formulas were derived and used including the assumptions made for implementation of the methodology.

2. The key factor for the analysis based on Random Vibration Theory (RVT) is the determination of peak factor based on the solution of the first passage problems. The peak factor is a function of several parameters such as the type of the random process (narrow band or broad band), duration of the process, zero crossing rate of the random variable, shapes of the power spectral density function, and the probability of non-exceedance. As such, provide in the TR a detailed derivation of the peak factor (p) used in the RVT application including the primary assumptions and its limitations as appropriate.

3. Include Figures of the peak factor that indicates the effect on the peak factors due to variations in the spectral parameters (such as zero crossing rates, $\delta$).

4. Describe in detail the proposed RVT approach that will be used in determining all the response quantities of interest including stress, strain, forces, moments and the in-structure response spectra including the probability of exceedance level assumed for the calculated response quantities.

5. Describe in detail how the duration of the strong ground motion was estimated, including the sensitivity of the derived input PSD and the response quantity of interest to any uncertainties in the estimation of the strong motion duration.

6. Include Figures of the final PSDs of the input ground motions used in the example problems of the TR.

7. Describe in detail how the time histories were selected. Was the guidance in Section 3.7.1, Acceptance Criteria II.1.B, of the NUREG-0800 followed in developing the time histories? What is the expected peak ground acceleration of the target response spectra used to generate the spectrum compatible PSD? What is the mean square acceleration value of the spectrum compatible PSD used in the analysis?

8. Indicate the location of the control point where the input motion is specified.

9. Indicate the specific options of the SASSI analysis program used in generating the results presented in the report.