PMLevyCOLPEm Resource

From: Anderson, Brian
Sent: Monday, February 14, 2011 1:10 PM
To: 'robert.kitchen@pgnmail.com'; Snead, Paul; 'david.waters@pgnmail.com'; 'tillie.wilkins@pgnmail.com'
Cc: PMLevyCOLPEm Resource
Subject: DRAFT RAI - SRP section 2.4.6 - Levy County Units 1 and 2 Combined License Application
Attachments: LNP Draft RAI 5528 - 2.4.6.doc

Importance: High

Attached is a draft RAI related to SRP section 2.4.6 for the Levy County Units 1 and 2 Combined License Application. Please let me know if you would like to schedule a conference call to discuss this RAI.

Thank you,
Brian

Brian Anderson
301-415-9967
Senior Project Manager, AP1000 Projects Branch 1
Office of New Reactors
U.S. Nuclear Regulatory Commission

Hearing Identifier: Levy_County_COL_Public
Email Number: 763

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Subject: DRAFT RAI - SRP section 2.4.6 - Levy County Units 1 and 2 Combined License Application
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Created By: Brian.Anderson@nrc.gov

Recipients:
"PMLevyCOLPEm Resource" <PMLevyCOLPEm.Resource@nrc.gov>
Tracking Status: None
"'robert.kitchen@pgnmail.com'" <robert.kitchen@pgnmail.com>
Tracking Status: None
"Snead, Paul" <paul.snead@pgnmail.com>
Tracking Status: None
"'david.waters@pgnmail.com'" <david.waters@pgnmail.com>
Tracking Status: None
"'tillie.wilkins@pgnmail.com'" <tillie.wilkins@pgnmail.com>
Tracking Status: None

Post Office: HQCLSTR01.nrc.gov

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MESSAGE	395	2/14/2011 1:09:59 PM
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Options
Priority: High
Return Notification: No
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Request for Additional Information No. 5528
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 02.04.06 - Probable Maximum Tsunami Flooding
Application Section: FSAR Section 2.4

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.06-***

In order to satisfy the requirements of 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 2, 10 CFR 52.79(a)(1)(iii), and 10 CFR 100.23(d), the applicant must provide the comprehensive geohydrological design basis which ensures that any potential hazards to the structures, systems, and components important to safety due to the effects of probable maximum tsunami (PMT) are considered in the plant design. The NRC staff reviews the PMT that may pose hazards to the site, including reviews of tsunamigenic source mechanisms, source parameters, propagation models, and near-shore inundation models.

In its review of tsunami wave propagation models, the NRC staff examines model parameters used to simulate the tsunami wave propagation from the source towards the site and input data, including bathymetry and topography data. The NRC staff's analysis of the PMT event considers the technique and conservatism used by a site and region specific model approach and its applicability to tsunami waves for calculating tsunami water levels at or near the site. Appropriate models avoid approximations of source geometry, bathymetry between the source and offshore of site, and topography near the site. Examples of shallow water wave equation models include COMCOT, ComMIT, and Delft3D, which are appropriate for earthquake-generated tsunamis. Examples of Boussinesq-type models are Coulwave, Funwave, Geowave, which are appropriate for earthquake/landslide/impact generated tsunamis.

If the applicant chooses to use a numerical model, the applicant is requested to clearly present all equations used, discuss all assumptions and associated conservatism inherent in the equations, and to present the procedure used to calculate the water-level values. Further, the applicant is requested to provide all input data sources, calculation packages, and any associated modeling input files.

If the applicant chooses to use an approach which relies on the Ward, et al. publication, the applicant is requested to provide a complete presentation of the theoretical assumptions that are relevant to propagation equations for a landslide-generated wave and runup/inundation. In addition, the applicant is requested to provide site-specific justification as to why the Ward equations are applicable and conservative for the proposed Levy County site. This discussion should include a presentation of the theoretical assumptions behind the generation, attenuation, shoaling, and runup equations, and a justification of why these assumptions are valid and conservative with respect to site-specific conditions.

Regarding tsunami generation, the applicant is requested to:
(1) Provide the reference for wave amplitude Equation 2.4.6-3, along with relevant assumptions used to develop that equation.
(2) Provide references for the expressions of slide velocity and a clear indication as to which expressions were used to calculation the slide velocities listed in Table 2.4.6-206.
(3) Provide the rationale and justification for using Equation 2.4.6-8 derived for impact tsunami sources to model landslide tsunamis, particularly with regard to difference in wave characteristics between landslide and impact tsunamis.
(4) Explain how diameter listed for each source in Table 2.4.6-206 relates to landslide parameters.

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Regarding tsunami propagation, the applicant is requested to:
(1) Explain how the “measurement point” is chosen to determine R, the distance of measurement point from the source.
(2) Justify the use of Equation 2.4.6-11. Because the “measurement point” is a nearshore location, justify the use of Equation 2.4.6-11 that is derived for constant water depth, considering the broad continental shelf offshore western Florida.
(3) Provide an expression for propagation across the continental shelf. If in a revised procedure, the applicant applies the propagation and shoaling terms at the edge of the continental shelf, the applicant is requested to provide an expression for propagation across the continental shelf.
(4) Provide additional information related to the equation for the attenuation curves (2.4.6-8). The applicant must provide the correct reference, domain of applicability of these fitted curves, and assumptions used to derive these curves.

Regarding tsunami runup, the applicant is requested to:
(1) Clarify the definition of h in Equation 2.4.15. This appears to be inconsistent with the definition indicated in FSAR References 2.4.6-228 and 2.4.6-237, from which this equation was taken. In the revised FSAR, the applicant indicates that h represents “shoreline wave height” whereas it is intended to represent runup as described in the aforementioned FSAR References.
(2) Provide the theoretical assumptions behind the equation 2.4.15, and justify why these assumptions are valid and conservative with respect to site-specific conditions.
(3) Clarify revised FSAR section 2.4.6.6.3.5. If revised Equation 2.4.15 is used to calculate runup, the applicant should confirm that revised section 2.4.6.6.3.5 is not necessary.
(4) Provide the geographic location (lat, long) and water depth where the shoaled amplitude A(R) in Table 2.4.6-207 is calculated.
(5) Provide location information for revised figure 2.4.6-230 “Landward Topographic Profile”, for example, in a map figure.

References:
http://library.lanl.gov/tsunami/ts242.pdf
http://ceeserver.cee.cornell.edu/pll-group/comcot.htm
https://tsunamiportal.arsc.edu/
http://nctr.pmel.noaa.gov/ComMIT/index.html
http://chinacat.coastal.udel.edu/programs/funwave/funwave.html
http://isec.nacse.org/models/description/2
http://www.usc.edu/dept/tsunamis/2005/staff/costassynolakis.html
http://www.coastal.udel.edu/~fyshi/

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