

## AP1000DCDFileNPEm Resource

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**From:** Loza, Paul G. [lozapg@westinghouse.com]  
**Sent:** Monday, June 07, 2010 5:42 PM  
**To:** Sanders, Serita  
**Cc:** Ray, Thomas J.; Melton, Michael A; Buckberg, Perry; Butler, Rhonda  
**Subject:** RE: Seismic Margin RAI - Chapter 19  
**Attachments:** Seismic Margin RAI 6-7-10.docx

Serita,

I acknowledge receipt for Westinghouse of revised question OI-SRP19.0-SPLA-12, revision TBD, attached. If this number is different, I will acknowledge again.

thanks,

Paul Loza

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**From:** Sanders, Serita [mailto:Serita.Sanders@nrc.gov]  
**Sent:** Monday, June 07, 2010 5:15 PM  
**To:** Loza, Paul G.  
**Cc:** Ray, Thomas J.; Melton, Michael A  
**Subject:** Seismic Margin RAI - Chapter 19

Paul,

We are finally here with the seismic margin RAI. Could please acknowledge this e-mail with a confirmation? Make sure that Rhonda Butler is on cc. Thanks.

Serita

**Hearing Identifier:** AP1000\_DCD\_Review  
**Email Number:** 415

**Mail Envelope Properties** (27265BDD489F164BAB98F1FFF637197250C56CDC)

**Subject:** RE: Seismic Margin RAI - Chapter 19  
**Sent Date:** 6/7/2010 5:42:12 PM  
**Received Date:** 6/7/2010 5:42:16 PM  
**From:** Loza, Paul G.

**Created By:** lozapg@westinghouse.com

**Recipients:**

"Ray, Thomas J." <raytj@westinghouse.com>  
Tracking Status: None  
"Melton, Michael A" <melto1ma@westinghouse.com>  
Tracking Status: None  
"Buckberg, Perry" <Perry.Buckberg@nrc.gov>  
Tracking Status: None  
"Butler, Rhonda" <Rhonda.Butler@nrc.gov>  
Tracking Status: None  
"Sanders, Serita" <Serita.Sanders@nrc.gov>  
Tracking Status: None

**Post Office:** SWEC9985.w-intra.net

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	604	6/7/2010 5:42:16 PM
Seismic Margin RAI 6-7-10.docx		19922

**Options**

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

## RAI for AP1000

In 10 CFR 52.47, "Contents of applications; technical information," there is a requirement that each application for design certification must include a "description of the design-specific probabilistic risk assessment (PRA) and its results" (§52.47(a)(27)).

Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)" includes Regulatory Position Part I, "Standard Format and Content of Combined License Applications." According to Section C.I.19.3 of this part, the scope of the assessment should be "a Level 1 and Level 2 PRA that includes internal and external events and addresses all plant operating modes."

Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," endorses ASME RA-S-2008, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" and ASME/ANS RA-Sa-2009, "Addenda to ASME/ANS RA-S-2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications."

Additional regulatory guidance is found in interim staff guidance: DC/COL-ISG-3, "PRA Information to Support Design Certification and Combined License Applications" (ISG-3) and DC/COL-ISG-020, "Seismic Margin Analysis for New Reactors Based on Probabilistic Risk Assessment" (ISG-20). ISG-20 identifies particular parts of the ASME/ANS standards that clarify the level of detail expected in the seismic margin analysis (SMA).

In support of design certification, the SMA is needed to confirm the adequacy of the seismic design and to identify plant-level seismic vulnerabilities. The staff's expectations for the SMA are detailed in ISG-20 as follows:

Topic	Applicable Interim Staff Guidance
1. plant system and accident sequence analysis	ISG-20, Section 5.1.1
2. seismic fragility evaluation	ISG-20, Section 5.1.2
3. plant-level capacity with HCLPF <sup>1</sup>	ISG-20, Section 5.1.3
4. assessment of capability	ISG-20, Section 5.1.3

In the application for amendment to the certified design, Westinghouse altered the specified site parameters. Two response spectra that were not considered in the certified design were added. In addition, proposed design changes have removed SSCs that are identified in the Table 19.55-1, "Seismic Margin HCLPF Values." Design changes may have otherwise altered the makeup of the list or individual HCLPF values. The amended DCD should contain the applicant's basis for concluding that the original SMA is still applicable. It would be helpful if the amended DCD included a description of the updated SMA in addition to the summary of results. As in the case of other external events, identifying the important assumptions and results in the DCD will ensure that a COL applicant referencing the AP1000 design has the correct basis for

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<sup>1</sup> When components that may control the plant-level capacity are qualified by prototype testing, the test response spectrum must be specified to demonstrate that no more than one percent rate of failure would be expected when the plant is subjected to the applicable seismic margin ground motion.

confirming that the AP1000 SMA still applies when plant- and site-specific features are considered.

Revise Section 19.55 of the DCD to include a description of the SMA, including assumptions, and methods in addition to the summary of results. The DCD description must provide enough information for the staff to confirm that adequate seismic margin has been demonstrated or will be established for the amended design. ISG-20, Section 5.4, "Position on Documentation," provides a list of information that would be sufficient to allow the staff to confirm the acceptability of the SMA.

In addition, provide a COL information item requiring COL applicants to update the SMA to address plant- and site-specific features. The applicant should identify plant-specific vulnerabilities and confirm the basis of the SMA. If the plant-level HCLPF is less than the target value, the applicant should perform a full convolution of sequence fragility for all sequences with a potential to lead to core damage to demonstrate that the seismic risk is acceptably low for the licensed plant.

ISG-20 provides guidance on this process in Section 5.2, "Position on Updating DC PRA-Based Seismic Margin Analysis by COL Applicants."

Also revise COL Information Item 19.59.10-1, "As-Built SSC HCLPF Comparison to Seismic Margin Evaluation" to indicate that the test response spectra must be chosen so as to demonstrate that no more than one percent rate of failure would be expected when the plant is subjected to the applicable seismic margin ground motion. This is consistent with ISG-20, and clarifies how the COL holder may confirm that prototype testing has demonstrated adequate seismic margin on a plant- and site-specific basis.