

Mitman, Jeffrey

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**From:** Ferrante, Fernando *mf*  
**Sent:** Thursday, December 17, 2009 8:32 AM  
**To:** Galloway, Melanie  
**Cc:** Mitman, Jeffrey; Vail, James; James, Lois  
**Subject:** RE: Request for Comments on IAEA Flooding Guide DS 417

Melanie,

My quick read of the IAEA guide indicates that the first definition is more open to discussion due to the use of the term "maximum possible" (as I highlighted below):

The volume of water stored by the structure at the time of failure should be considered as the maximum possible (e.g.; top of the flood storage pool)

for which the top of the flood storage pool is an example. Having said this, I believe that the burden should be on any assertion of that a lesser elevation than the top of the water storage structure should be considered for failure analysis to prove that it is indeed the maximum possible (i.e., that overtopping is not credible). For seismic dam failures, RG1.59 points to the ANSI/ANS standards. In ANSI/ANS-2.8-1992, this issue is covered in the following sections and subsections:

## 6. Nonhydrologic Dam Failures

**6.2.2.1 Timing of Seismic Disturbance.** For conservatism, any postulated breach should be timed to coincide with the maximum reservoir level from the coincident flood

## 9. Combined Events Criteria

**9.2.1.2 Seismic Dam Failures.** Although the principal cause of a dam failure might be from an earthquake, it is possible that the peak of a flood could coincide with the few minutes' duration of the earthquake. The higher of the following two alternative combinations is an adequate design base for seismic dam failure floods.

Alternative I

- (1) 25-yr flood.
- (2) Dam failure caused by the safe shutdown earthquake (SSE)<sup>48</sup> coincident with the peak of flood.
- (3) 2-yr wind speed applied in the critical direction.

Alternative II

- (1) One-half PMF or 500-yr flood, whichever is less.
- (2) Dam failure caused by the operating basis earthquake (OBE)<sup>48</sup> coincident with the peak of flood.
- (3) 2-yr wind speed applied. in the critical direction.

<sup>48</sup>Title 10, Code of Federal Regulations, Part 100. "Reactor Site Criteria," Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," Government Printing Office, Washington, D.C.

In short, the ANSI/ANS guidance appears to be more stringent than what is proposed in the IAEA document (normal pool level) since it suggests that the timing of the seismic event considers a coincident flood as described Alternative I and Alternative II above (whichever is higher). The issue then becomes what elevation corresponds to:

max{ [ (25-year flood AND Safe Shutdown Earthquake) OR min( (1/2 PMF OR 500 year flood) AND Operating Basis Earthquake) ] AND 2-year wind speed in critical direction}.

Thanks,  
Fernando

*MR*  
**From:** Galloway, Melanie  
**Sent:** Thursday, December 17, 2009 7:18 AM  
**To:** Ferrante, Fernando  
**Cc:** Mitman, Jeffrey; Vail, James; James, Lois  
**Subject:** FW: Request for Comments on IAEA Flooding Guide DS 417

I glanced at the attached draft IAEA guide yesterday and noted in section 5.124 that the volume of water considered possible should be at the top of the *flood storage pool* (is it correct to assume that that equates to 1125' at Jocassee?). That section goes on to say that for seismic events the top of the *conservation pool* (would that be 1110' for Jocassee?) should be considered because earthquakes and floods are not related events. That distinction and the associated reservoir heights (if I have assumed corrected in terminology definition--what do you think?) make sense to me.

The question is do our guidance documents contain anything similar? that is, do any clearly state that when assuming dam failure licensees need to assume the PMP?

*MR*  
**From:** Bagchi, Goutam  
**Sent:** Wednesday, December 16, 2009 10:46 AM  
**To:** Randall, John; Ahn, Hosung; Caverly, Jill; Cook, Christopher; Ferrante, Fernando; Giacinto, Joseph; James, Lois; Jones, Henry; Kammerer, Annie; Kanney, Joseph; Nicholson, Thomas; Philip, Jacob; Rajiv Prasad; See, Kenneth; Tiruneh, Nebiyu; Vail, James; Wescott, Rex; Harvey, Brad  
**Cc:** Raione, Richard; Chokshi, Nilesh; Galloway, Melanie  
**Subject:** Request for Comments on IAEA Flooding Guide DS 417

To the addressees:

The forth coming IAEA workshop on flooding, January 11-15, 2010, has a session on member country comments on DS 417 (attached). The US reps are to make a short presentation on the US comments. Please help us by giving us your comments as soon as you can. I know this is a late request, kindly give it a quick look and share your thoughts. I do not think that the usual process of NRC-wide request for comments has been initiated yet. I am most grateful for all your help and cooperation. Best regards and

*Thank you,  
Goutam Bagchi*