

Enclosure 2: Comments on Draft of External Flooding RASP Guidance from Regional Offices

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
RI	1		I reviewed the enclosure and have no comments or edits. I view the enclosure as an informative summary of the essential elements to be considered for evaluating PDs involving flooding vulnerabilities and/or related operator response. Of particular value is the listed examples that can be used by analysts for future reference. One possible enhancement would be to include the ML numbers for the reports these examples were taken from.		Inspection report and ADAMS Accession numbers were added.
RII	2		RASP guidance should provide suggested approaches and guidance for performing risk assessments and the guidance is not meant to be a step-by-step procedure.		<p>Revised Section 1 to clarify the objectives and the scope to this comment and Comment 24, which stated that the RASP guidance needs to provide a more detailed specific step-by-step process for assessing the risk of external flooding events.</p> <p>The first objective of the RASP Handbook, as described in Section 1.1 of Volumes 1 and 2, "was to document methods and guidance that NRC staff could use to achieve more consistent results when performing risk assessments of operational events and licensee performance issues."</p>

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
					The external flooding guidance, without providing a step-by-step procedure, attempts to improve consistency by documenting references that might be utilized, discussing potential issues, and describing some lessons from past analyses.
RII	3		Breakdown flooding hazards and for each flooding mechanism provide an example of how the issue was screened, what methods was used, the limitations on the methods, and a collection of methods used to date.		<p>Relevant references for assessment of each flooding mechanism are provided in Section 2. In addition, Appendices A and B provide ADAMS references for past external flooding assessments (those Appendices do not discuss details of external flooding hazard assessments for those events).</p> <p>External flooding hazard assessments for the limited number of external flooding events that were not screened have been generally performed on an ad hoc basis. Considering that various flooding mechanisms exist, providing details of those ad hoc assessments for each flooding mechanism was cumbersome and viewed to be beyond the scope of a guidance document. Furthermore, details on some of the past flooding hazard assessments are not available.</p> <p>In the next revision of this guidance, which will be developed following completion of the ongoing probabilistic flood hazard assessment project that aims at developing a PFHA framework, a more specific</p>

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
					guidance for each flooding mechanism along with descriptions of robustness, strengths and weakness of methods will be provided.
RII	4		Flooding hazard is not a uniform distribution during seasons and the flooding levels due to hurricane, ice melt, etc. may change at various times of the year. This change could be used as a screening tool to disposition some SDPs.		<p>Revised Section 1 to clarify the scope of the external flooding guidance.</p> <p>The scope of this guidance includes evaluations of those events that could not be dispositioned with screening methods and, therefore, require more detailed assessments. Guidance for screening external flooding events will be provided in other documents.</p>
RII	5		Benchmark methods that are proposed against a set of findings.		<p>Section 1 was revised to clarify the objective and scope of the guidance. As discussed under response to Comments 3 and 24, providing a more detailed discussion of methods appeared to be impractical at this time.</p> <p>In the next revision of this guidance, which will be developed following completion of the ongoing probabilistic flood hazard assessment project, datasets and methods used for flood hazard assessments will be evaluated more thoroughly that possibly includes examples on how these methods are applied.</p>
RII	6		SDP assessments attempt to find the closest range of risk and this can be accomplished at		Section 1 was revised to clarify the scope of the external flooding guidance.

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
			times by coarse screening. The guidance should discuss tools and methods that could be used for screening.		The scope of this guidance includes evaluations of those events that could not be dispositioned with screening methods and, therefore, require more detailed assessments. Guidance for screening external flooding events will be provided in other documents.
RII	7		In the past cases, discuss what it took to get to success and flag the cases that were not within the SRAs capabilities in terms of tools, computational power, etc. and needed outside resources.		As discussed in the revision of Section 1, the scope of this guidance includes evaluations of those events that could not be dispositioned with screening methods and, therefore, require more detailed assessments. Because of the need for these detailed assessments, most of these cases required some level of input from outside resources. Furthermore, as explained under resolution for Comment 3, assessments for the limited number of external flooding events that were not screened have been generally performed on an ad hoc basis. Providing details of those ad hoc assessments was cumbersome and viewed to be beyond the scope of a guidance document.
RII	8		Discuss what the needs are for simple screening at elevations like switchyard elevation.		Sections 1 and 3 were revised to clarify the scope and discuss consideration of flooding events at elevations such as the switchyard elevation. As discussed under resolution of comments 4 and 6, The scope of this guidance includes evaluations of those events that

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
					could not be dispositioned with screening methods and, therefore, require more detailed assessments. Guidance for screening external flooding events will be provided in other documents.
RII	9		Sometimes external events need to be analyzed (coarse screening) for internal events findings.		Section 1 was revised to clarify the scope of the external flooding guidance. The scope of this guidance includes evaluations of those events that could not be dispositioned with screening methods and, therefore, require more detailed assessments. Guidance for screening external flooding events or coarse screenings that are performed to support internal events findings will be provided in other documents.
RII	10		Cliff edge effect should be discussed as it can change a finding from Green to Red.		Section 4.1 was revised to include a discussion of cliff-edge effect.
RIII	11		Please merge this information with existing external event RASP guidance. In particular there is existing very useful information about dam failure probabilities.	We don't want to lose track of the useful, but limited, guidance that has previously been developed.	Sections 2 and 3 were revised, Appendix C was added.
RIII	12		Please add a caution to Objectives and Scope. The caution should clearly summarize that much of the information in this document	This document successfully provides information about what has previously been	Section 1 was revised to better define the objectives and scope of the guidance.

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
			discusses methods/data that have not been developed to the point of being practically applied in the SDP and that Appendix M is likely to be needed. Also, delete the word “practical” from the first sentence.	<p>done in SDP. However, almost all previous SDPs needed to use Appendix M because of the lack of tools, methods, and data. This guidance provides background and explains the potential problems very well, but does not provide methods or data.</p> <p>We need to be careful that this document does not suggest the NRC tackle the difficulties on PFHA in the context of SDP analysis.</p>	
RIII	13	3.1, paragraph 3	This is the place to merge in the existing information about dam failures in RASP		Section 3 was revised and Appendix C was added to include the existing information about dam failures.
RIII	14	3.2	Revise second to last paragraph that directs risk analysts to consult hydrologists and other experts.	We often do consult experts outside the region but we should not develop processes that essentially require it.	That Section was revised.

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
			SDP tools, methods, and techniques need to be able to be applied by regional SRAs. Methods documents should not direct that outside consultants are a necessary part of the process.	This is contrary to the philosophy of decision-making based on “best available” information.	
RIII	15	3.3, paragraph beginning, “Figure 1 provides...”	Please delete, “Since data cannot support flood estimates in this range, risk analysts must rely on the knowledge and understand of hydrologic processes to estimate extreme floods”	SRAs do not currently have the skills to do this and the RASP manual.	That Section was revised.
RIII	16	3.3, page 6	Delete sentence, “The risk analyst should note that the limits of extrapolation for rare flooding events should be determined by evaluating the lengths of records, number of stations in a hydrologically homogeneous region, degree of correlation between stations, and other data characteristics...”	SRAs do not have the knowledge, skills, tools or time to do what is suggested here.	The sentence was revised.
RIII	17	3.5	Please delete, “In making a risk-informed decision, the risk analyst should consider the range of results obtained from the hazard curves in combination with qualitative factors and not solely focus on the mean hazard.”	This is not appropriate guidance for RASP. Better suited for IMC 0609, IMC 0308.	The sentence was revised.

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
RIII	18	4.2.1	Delete reference to RIS 2008-15 and Mitigating Strategies.	The RIS and any credit for mitigating strategies is separate from external flooding and is already addressed by RASP.	Section 4.2 was revised and a number of references were deleted.
RIII	19	4.2.1	Delete references to RES studies an EPRI studies that are not yet completed or are not used in SDP.	<p>Note that SPAR-H is used in SDP. ATHEANA has never been used in SDP, EPRI methods are used by licensees, and IDHEAs in not yet available.</p> <p>By discussing these methods in RASP, we are implying that they are tools that could/should be used in SDP</p>	Section 4.2 was revised and those references were deleted.
RIII	20	4.2 last paragraph	Delete statement to consult an HRA expert.	For ROP, SRAs are the experts. Guidance documents should not direct that outside assistance is required. HRA and other assumptions are reviewed by the peer review process.	The sentence was revised.

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
RIII	21	4.2.3	Please delete the reference to the RIS and the statement that the NRC will consider licensees' analysis for providing qualitative insights	This is inappropriate in the External Flood RASP guidance.	Section 4.3 was revised. This section was provided because of the staff's experience with past SDP analyses, in which the licensee attempted to demonstrate feasibility or reliability of human actions after an event has occurred and asked the staff to provide credit for such actions. The staff believes that description in this Section is relevant, as the licensees have asked for this credit in previous analyses, and is technically consistent with how the staff responded to licensees' requests in the past.
RIII	22		In the Examples in Appendices A and B, provide the Inspection Report numbers and the color of the findings.	To allow a reader to easily obtain further information on the nature of the examples.	Inspection report numbers and the color of findings were provided.
RIII	23		Editorial comments provided in an email dated 11/9/2015.		Editorial changes were incorporated.
RIV	24		The RASP guidance needs to provide a more detailed specific step-by-step process for assessing the risk of external flooding events.		Revised Section 1 to clarify the objectives and the scope in response to this comment and Comment 2, which stated that guidance should provide suggested approaches for performing risk assessments and the guidance is not meant to be a step-by-step procedure. The first objective of the RASP Handbook, as described in Section 1.1 of Volumes 1 and 2, "was to document methods and

Source	#	Section	Comment	Basis for the Comment	Resolution of the Comment
					<p>guidance that NRC staff could use to achieve more consistent results when performing risk assessments of operational events and licensee performance issues.”</p> <p>The external flooding guidance, without providing a step-by-step procedure, attempts to improve consistency by documenting references that might be utilized, discussing potential issues, and describing some lessons from past analyses.</p> <p>Because of diverse nature of external flooding events and lack of widely accepted methods for some aspects of external flooding assessments, development of a detailed and step-by-step guidance appeared to be impractical at this time. Nevertheless, the guidance attempts to improve consistency of external flooding risk assessments, which is the first objective of RASP Handbook, by documenting references that might be utilized, discussing potential issues, and describing some lessons from past analyses.</p>