

FAQ 017: Hazards that Must be Evaluated

A. TOPIC: IA Scope: Hazards that must be Evaluated

Source document: IA ISG: JLD ISG 2012-05 Section: 5.2

B. DESCRIPTION:

Section 5.2 of JLD ISG 2012-05 ("Identification of Controlling Flood Parameters) contains the following statement: "...the integrated assessment should be performed for a set(s) of flood scenario parameters defined based on the results of the Recommendation 2.1 hazard reevaluations." Is an integrated assessment required for an entire hazard if only a single associated effect of a flooding mechanism is not bounded by the current design basis?

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D. RESOLUTION: (Include additional pages if necessary. Total pages: 3)

Inquiry number: 017 Priority: H

Introduction

The NRC's March 2012 50.54(f) letter states that an integrated assessment is required if the "current design basis floods do not bound the reevaluated hazard for all flood causing mechanisms". With respect to the above quotation, the answer to this FAQ lies in part in understanding the distinction between flood hazard and associated effects. A "flood hazard" or "mechanism" refers to a flooding event such as a hurricane, tsunami, local intense precipitation, or dam failure that results in a flood height and associated effects. "Associated effects" are factors in addition to flood height that must be calculated as part of the flood hazard evaluation. Examples of associated effects include debris effects, wind waves, hydrodynamic loading, sediment deposition and erosion, groundwater egress, etc. (see JLD-ISG-2012-05, page 36). This FAQ addresses the manner in which associated effects act as a "trigger" for an integrated assessment.

In general, an integrated assessment is required for the entire flood causing mechanism if any of the associated effect(s), determined by a licensee's flooding reevaluation, exceeds the corresponding associated effect(s) defined in the current design basis (CDB) for that flood causing mechanism. Additionally, if one or more associated effect(s) were not considered in the CDB, those effect(s) would be treated as being not bounded with respect to the need to perform an integrated assessment. Remember that flood level is not an associated effect. If the flood level in the reevaluated hazard exceeds the design basis flood level, a full scope integrated assessment is required. The question is: must an integrated assessment be completed on an entire flood-causing mechanism if only the mechanism's associated effects differ from the current design basis?

Guidance

If only a single associated effect of a flooding mechanism is not bounded by the CDB, it is reasonable to focus the effort of the integrated assessment evaluation to initially consider only the changes introduced by the new or more severe associated effect(s). It is only necessary to reevaluate the overall current licensing basis (CLB) strategy when there is reason to believe that the associated effect influences other aspects of the evaluation. The entire strategy for response to the flood mechanism may not have been compromised or may not deviate enough from the CLB to

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warrant further analysis.

The following guidance should be followed.

- Determine what aspects of the reevaluated hazard are not bounded by the CDB.
The integrated assessment must address the entire flood-causing mechanism if the reevaluation shows more than one associated effect or the overall flood level for that flood-causing mechanism is not bounded by the CDB flood evaluation.
- If any part of the plant response to a hazard that is not bounded by the CDB depends on mitigation (as opposed to protection), the integrated assessment must address the entire flood-causing mechanism.
- Evaluate the extent to which plant response could be influenced by the associated effect.
 - Document which aspects of the reevaluated hazard and plant response are being addressed in the integrated assessment and which are not.
 - Evaluate the flood protection features and operator responses to determine if they are capable of handling the conditions related to the newly identified associated effect that was not specifically addressed in the CLB.
 - Use the guidance in the integrated assessment ISG (JLD-ISG-2012-05) to determine what kind of evaluations need to be considered.
 - Justify the scope of the resulting Integrated Assessment by explaining why the aspects of the hazard or plant response that are not being addressed are unchanged or not affected. (e.g., Debris is the “new” associated effect in the reevaluated hazard. The reliability of operator actions will not be assessed because they are not affected by the debris since all operator actions are performed inside buildings and none of the flood barriers or buildings’ flood protection features will fail to perform their flood protection function as a result of the debris).
- If the evaluation being performed indicates that some of the flood protection features or CLB strategies are possibly challenged by the associated effect(s), the evaluation should be extended to cover these aspects.
- If the associated effect causes the hazard or CDB protection levels to be exceeded, then the entire flood causing mechanism with the associated effect should be included for evaluation under the IA.
- Non-bounding effects related to loading conditions (hydrostatic, hydrodynamic, wind-waves, debris, etc.) should be evaluated considering the total load on the flood protection feature.

Example:

A site on a lake shore with an adjacent river completes a flooding reevaluation that includes evaluations of the local intense precipitation, seiche, and dam break flooding mechanisms. The reevaluation results are bounded by the CDB for all these mechanisms and all the associated effects except for debris loading following a dam break. The CDB is silent on debris loading.

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The integrated assessment is initially focused on all aspects of the hazard that might be affected by the debris effect including static and dynamic loads on structures, effects on operator actions, effects on flood level if blockage of drainage systems or downstream damming is possible, site access, etc. If any of these aspects are challenged by the debris, the integrated assessment must be extended to fully evaluate the effects of the challenge. For example, if a flood barrier fails due to debris loading, the effect of the flood on all subsequently inundated equipment and affected operator actions must be evaluated in accordance with the guidance in JLD-ISG-2012-05.

The report also identifies what aspects of the dam break and plant response are not being addressed in the integrated assessment and justifies why this is appropriate. For example, if the warning time associated with the dam break is greater than the design basis warning time, the ability to perform any operator actions that occur prior to the flood water reaching the site need not be evaluated. This conclusion must be documented and justified in the integrated assessment report.

The integrated assessment does not need to address the local intense precipitation or seiche mechanisms since they are bounded by the current design basis flood hazard evaluation.

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E. NRC Review:

Not Necessary _____

Necessary X

Explanation: _____

F. Industry Approval:

Documentation Method: _____ Date: _____

G. NRC Acceptance:

Interpretation _____

Agency Position _____

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