

**FAQ 33: HRR – Options for Interim Actions for Challenging HRRs~~for Partial Mitigation~~**

**A. TOPIC:** HRR – Options for Interim Actions for ~~Partial Mitigation~~ Challenging HRRs

Source document: March 1, 2013 Eric Leeds 50.54(f) Supplemental Information Letter Section:         

**B. DESCRIPTION:**

What ~~methods~~ options could be considered to develop interim actions as part of the Hazard Reevaluation Report submittal if the reevaluated hazard is particularly challenging ~~or cannot be fully addressed by protection or mitigation?~~

March 1, 2013 Eric Leeds 50.54(f) Supplemental Information Letter states the following:

*"Interim Actions (Requested Information Item 1.d)*

*Licensees whose Hazard Reevaluation results are not bounded by their current design basis were requested to describe in their 50.54(f) letter response interim actions, taken or planned, to address the reevaluated flooding hazard while the staff assesses the safety and regulatory significance of the reevaluated hazard. The staff's review of the proposed interim actions will leverage appropriate sections and concepts from existing guidance documents such as NEI 1207, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features and JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding to evaluate the acceptability of the interim actions.*

*Licensees should describe the interim actions in sufficient detail to allow the NRC staff to assess their acceptability, in order to allow licensees the time needed to perform the integrated assessment and then implement permanent plant modifications, if necessary. The NRC staff will consider the appropriateness of the interim actions in the context of a licensee's ability to respond to the reevaluated flooding hazard(s) and how these actions continue to provide assurance of the licensee's ability to maintain the plant in a safe condition."*

**C. Initiator:**

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**D. RESOLUTION:** (Include additional pages if necessary. Total pages: 4 )

Inquiry number: 33 Priority: H

**The Basis for Interim Actions**

The NRC's March 2012 50.54(f) cover letter states that the current regulatory approach and the resultant plant capabilities provide confidence that an accident with consequences similar to the Fukushima accident is unlikely to occur in the United States. The NRC letter concluded that continued plant operation and the continuation of licensing activities do not pose an imminent risk to public health and safety. Requested Information item 1.d of Enclosure 2 to the NRC letter states that the final report should contain "Interim evaluations and actions planned to address any higher flooding hazards relative to the design basis, prior to completion of the integrated assessment described below, if necessary."

The flooding reevaluations being performed in response to the NRC's March 12, 2012 50.54(f) letter are for beyond design basis events. As such, they do not constitute an immediate operability concern and are not reportable outside of the response to the 50.54(f) letter unless the reevaluation results identify concerns with the current licensing or design basis. Note however, that the new condition may need to be entered into the corrective action program for evaluation.

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#### Concepts for Interim Actions

Based on the conservatism in the deterministic approaches being used to reevaluate flooding hazards in accordance with present day methodology, these events could be very unlikely events. If the results of the reevaluated hazard exceed the current design basis, interim actions should be implemented as soon as reasonable. The time frame for development and deployment of interim actions should be informed by the relative risk(s) and frequency of occurrence (if known) of the updated flooding event evaluated for the Hazard Reevaluation Report (HRR). The time frame will also be impacted by the significance of the scope of the interim actions, and time needed to develop and implement them. Interim actions should focus on assuring the ability to maintain the ~~critical key~~ safety functions necessary to prevent core damage, spent fuel damage, and loss of containment integrity as a result of the new beyond design basis flood determined in the Hazard Re-evaluation Report (HRR). The NRC has described interim actions in the March 1, 2013 Eric Leeds 50.54(f) Supplemental Information Letter. Also, the NRC inspection procedure TI- 2515/190, used to inspect interim actions at the sites, provides additional insights on the appropriate actions to be put in place.

In some cases, the severity of the hazard defined by the HRR will be such that the event will be particularly challenging to the CDB or in the most severe cases, it may not be possible to fully protect or mitigate the site from its effects by implementing interim actions. As the licensee is considering its strategy, the following concepts might be useful. Note that the bullets below describe a compilation of concepts developed by the industry. This FAQ was discussed with the NRC but their concurrence was not received. NRC concerns identified during meetings on the subject are shown in brackets using *italicized* font. Licensees should keep the NRC concerns in mind as they consider these concepts in the determination of interim actions intended to mitigate their plant specific hazards.

*[General NRC ~~Comment~~Concern: The NRC's main message during the discussion of this FAQ was that situations where the calculated flooding event ~~cannot be completely mitigated~~is particularly challenging need to be handled on a case-by-case basis. Licensees should contact their NRC Project Manager prior to the HRR submittal to explain the conditions and explore options. In addition, since the 50.54(f) letter requests that the HRR should include interim evaluations and actions taken or planned in cases where the flooding CDB is exceeded, any licensee HRR submittals that show results greater than the flooding CDB and which do not identify interim evaluations or actions will receive particular scrutiny.]*

- Implement all practical protection and mitigation strategies: ~~Even if it is not possible to fully mitigate the reevaluated hazard, recognizing~~ Recognizing that the event may have a low frequency of occurrence, consider enhancing the existing mitigation strategies or flood protection features and implement new ones to the maximum extent practical. Any amount by which the current flood protection and mitigation features are enhanced makes the likelihood of exceeding their capabilities less.
- Refine the hazard considered: For the most part, the flooding hazard determination is a deterministic evaluation using the conservative combinations of parameters and events defined by the various governing regulatory guides, NUREGs, ISG documents, and standards. The resulting flooding hazard may be an unlikely event. Since the reevaluated flooding hazard is a beyond design basis event for existing plants, it is reasonable to further refine the analysis of the reevaluated hazard to a more credible event (as opposed to a bounding event that may result from a full application of the conservatism in the governing guidance documents). Precedent evaluations should be reviewed and additional research may be warranted to justify the use of alternate methods.

*[NRC commented that the likelihood of a given hazard is very plant specific. As a result, the event determined by the deterministic evaluation methods described in the various Reg Guides and other*

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*documents may not be unlikely in all cases.]*

- Monitoring: Monitor the status of input parameters whose assumed values drive the reevaluated flood hazard and take a graded approach to actions as those parameters approach their assumed values. For example, if a dam failure evaluation assumes a 100 year snow pack, monitor the actual snow pack at an appropriate frequency, increase the frequency if a defined threshold is reached, engage the operator of the dam to evaluate plans for water management if the snow pack continues to increase, and shutdown the plant if the 100 year snow pack is reached and the resulting flood cannot be fully protected or mitigated.
- Use of "FLEX"-type equipment: FLEX was designed as a means of mitigating beyond design basis events. To the extent that it is implemented at a site, FLEX equipment, or other equipment with similar functionality, could be considered to maintain critical-key safety functions. If this strategy is used, ensure that FLEX equipment storage locations, connection points, and associated procedures appropriately consider the flood height and conditions determined by the reevaluation results so that equipment access and functionality are maintained.

*[NRC has stated-commented that it is acceptable to use FLEX equipment to mitigate the hazard determined by the HRR.]*

- Allowing flood waters to enter plant buildings: The critical-key safety functions to maintain are core and spent fuel pool cooling and containment integrity. In some extreme situations a strategy such as removing the vessel head, flooding up the vessel and refueling canal, and allowing flood waters to enter site buildings with the possible loss of SSC's that are not required to provide the necessary cooling function, may be necessary.

Note that interim actions do not have to be permanent modifications. The Integrated Assessment will determine the long term mitigation or protective actions that will be considered by the NRC during their 10CFR50.54(f) letter section 2.1 Phase 2 review to determine if any regulatory actions are needed to protect against the updated flooding related hazards (e.g., include in the site's licensing basis and mitigation strategy).

#### Rigor for Interim Actions

The following additional items should be considered as interim actions are determined:

- All new interim flood protection features (e.g., sandbags inflatable barriers, self inflating flood bags, ventilation louver covers) should be acquired, pre-staged and maintained to provide the planned protection or mitigation.
- The design of the new flood mitigation equipment should be evaluated to withstand the environmental conditions that might accompany the applicable reevaluated flood event.
- Station procedures should be revised to direct installation of the new flood mitigation equipment including appropriate event triggers to activate the procedures.
- Training on the use and installation of the new flood mitigation equipment should be conducted for all necessary personnel.
- Installation of the new flood mitigation equipment should be evaluated to ensure that it can be properly installed within the planned timeframes using reasonable simulations, or other appropriate methods.

**Comment [A1]:** Included in FAQ 031

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NOTE: FAQ-031 also contains guidance on interim actions.

Revision: ~~0m0o~~ \_\_\_\_\_ Date: 7/10/14 \_\_\_\_\_

**E. NRC Review:**

Not Necessary X \_\_\_\_\_ Necessary \_\_\_\_\_

Explanation: This FAQ was discussed with the NRC who expressed concern with some of the concepts as indicated above. NRC concurrence was not received. The FAQ is being issued as a compilation of concepts developed by the industry.

**F. Industry Approval:**

Documentation Method: \_\_\_\_\_ Date: \_\_\_\_\_

**G. NRC Acceptance:**

Interpretation \_\_\_\_\_ Agency Position \_\_\_\_\_

Documentation Method: N/A \_\_\_\_\_ Date: \_\_\_\_\_