

NRC STAFF GUIDANCE

REGULATORY DECISIONMAKING FOR REEVALUATED FLOODING AND
SEISMIC HAZARDS FOR OPERATING NUCLEAR POWER PLANTS
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EXECUTIVE SUMMARY

1. PURPOSE

The purpose of this enclosure is to provide guidance to U.S. Nuclear Regulatory Commission (NRC) staff for making regulatory decisions to complete and close out activities associated with the reevaluated seismic and flooding hazards requested from licensees in the Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(f) letter issued on March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML12053A340). A Commission staff requirements memorandum (SRM) dated July 28, 2015, approving the staff's Mitigating Strategies and Flooding Hazard Reevaluation Action Plan in COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession Number ML15153A104), directed the staff to provide the guidance for regulatory decisionmaking for the reevaluated flood hazards to the Commission for information prior to implementation. Because the processes and decisionmaking for the reevaluated seismic and flooding hazards are similar, including the underlying regulations and use of risk-informed processes, this guidance addresses both activities. As discussed in this enclosure, the staff will use existing guidance for making risk-informed decisions and evaluating the need for plant-specific backfits.

2. BACKGROUND

In response to the March 2011 accident at Fukushima Dai-ichi in Japan, the NRC performed various assessments and took specific steps to address lessons learned from the event. The agency's response has continuously evolved since the issuance of the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession Number ML111861807), which was completed shortly after the event. The purpose of this plan is to support the completion of activities related to NTTF Recommendation 2.1, which involves a reevaluation of seismic and flooding hazards using present day methodologies and guidance.

As part of the response to the Fukushima accident, the NRC issued a letter to power reactor licensees pursuant to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Section 50.54(f) (hereafter referred to as the 10 CFR 50.54(f) letter). That letter requested that licensees reevaluate the seismic and flooding hazards at their sites using updated hazard information and current regulatory guidance and methodologies. The request for information and the subsequent NRC evaluations were described as two phases:

Phase 1: Issue 10 CFR 50.54(f) letters to all licensees to request that they reevaluate the seismic and flooding hazards at their sites using updated seismic and flooding hazard information and present-day regulatory guidance and methodologies and, if necessary, to request they perform a risk evaluation.

Phase 2: Based upon the results of Phase 1, the NRC staff will determine whether additional regulatory actions are necessary (e.g., updating the design basis and structures, systems, and components (SSCs) important to safety) to provide additional protection against the updated hazards.

Licensees with plants for which the reevaluated seismic hazards significantly exceeded the current design-basis earthquake were requested to perform a risk assessment (i.e., seismic probabilistic risk assessment (SPRA) or seismic margins assessment (SMA)). For sites with low to moderate reevaluated seismic hazard exceedance above their current design-basis, the NRC staff concluded that a SPRA or SMA was not necessary (ADAMS Accession Number ML15194A015). For those licensees that need to perform a risk assessment, the SPRA or SMA will yield both qualitative and quantitative risk insights. For flooding hazards, necessary adaptations to the process were made to account for differences in the state of practice between the two hazards in the application of quantitative risk assessments. Specifically, in cases where the reevaluated flooding hazard exceeds the current design basis, licensees were requested to perform an integrated assessment. The integrated assessment supports the use of probabilistic risk assessment concepts and tools as well as systematic processes to yield insights similar (to the extent possible) to those resulting from the SPRA or SMA. For both hazards, the SPRA, SMA, and integrated assessment are intended to yield information and insights to support Phase 2 regulatory decision-making consistent with NRC's risk-informed regulatory processes as described in Office of Nuclear Reactor Regulation (NRR) office instructions (OIs) LIC-504, "Integrated Risk-Informed Decision-Making Process for Emergent Issues" (ADAMS Accession Number ML14035A143) and Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (ADAMS Accession Number ML100910006), and the plant-specific backfit process described in NRR OI LIC-202, "Procedures for Managing Plant-Specific Backfits and 50.54(f) Information Requests" (ADAMS Accession Number ML092010045).

Along with issuance of the 10 CFR 50.54(f) letter, one of the NRC's primary regulatory actions taken in response to lessons learned from the Fukushima accident was issuance of Order EA-12-049 (ADAMS Accession Number ML12054A735), which directed power reactor licensees to develop, implement, and maintain guidance and strategies ("mitigating strategies") to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities following a beyond-design-basis external event, and the related Mitigation of Beyond-Design-Basis Events (MBDBE) rulemaking (ADAMS Accession Number ML15049A213). The actions required by the Order provide additional defense-in-depth and diversity for mitigating beyond-design-basis external events.

In COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards" (ADAMS Accession Number ML14238A616), the NRC staff described issues related to the implementation of Order EA-12-049 and the MBDBE rulemaking and the completion of flooding reevaluations and assessments. The staff proposed an approach for coordinating requirements to implement mitigation strategies for beyond-design-basis external events with additional plant-specific actions, if warranted, to address reevaluated flooding hazards. In the SRM for COMSECY-14-0037, the Commission affirmed that licensees for operating nuclear power plants

need to address the reevaluated flooding hazards within their mitigating strategies for beyond-design-basis external events. The Commission did not approve the staff's recommendation to integrate activities associated with the flood hazard reevaluations and mitigating strategies, but instead directed the staff to reassess the guidance developed for the Phase 1 integrated assessments and develop the criteria and guidance for Phase 2 of the flooding reevaluations. The Commission further directed the staff to prepare a plan for achieving closure of this recommendation to the Commission for review and approval. The staff subsequently described a closure plan in COMSECY-15-0019. The Commission's SRM for COMSECY-15-0019 approved the staff's plan and included the following direction to the NRC staff:

As discussed in the COMSECY, the staff plans interactions with stakeholders, including the public, industry and the Advisory Committee on Reactor Safeguards (ACRS) as guidance is developed for integrated assessments and associated regulatory decisionmaking. As such, the quantitative risk criteria discussed in the COMSECY should be considered preliminary at this stage. The staff should provide the guidance for integrated assessments and associated regulatory decisionmaking to the Commission for information prior to implementation.

The staff should continue to look for additional opportunities to address any over conservatism in the flood hazard evaluations and to streamline the process as additional lessons are learned.

The staff should keep the Commission informed of the progress on implementation of the mitigating strategies and flooding hazard reevaluation action plan and should raise any additional policy issues that may be identified to the Commission promptly for resolution.

Consistent with the plan described in COMSECY-15-0019, the agency's overall response to flooding is designed to ensure timely regulatory actions, while also seeking to improve understanding of related risks. The flooding action plan identifies two primary activities.

- 1) Ensure licensees develop and implement mitigating strategies that are able to address reevaluated flooding hazards, and
- 2) Complete the flooding hazard reevaluations and close the flooding portion of the 10 CFR 50.54(f) letter, including:
 - a. Developing a graded approach to identify the need for, and prioritization and scope of, plant-specific integrated assessments, and
 - b. Developing criteria and guidance to support decisionmaking related to plant-specific regulatory actions.

With respect to Activity 2.a. above, the industry has prepared guidance in NEI 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession Number ML16165A178), to implement the focused evaluations and revised integrated assessments described in COMSECY-15-0019. The staff has reviewed and endorsed the guidance, with clarifications and exceptions, in JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flooding Hazard Reevaluation; Focused Evaluation

and Integrated Assessment" (ADAMS Accession Number ML16162A301). The industry and NRC guidance documents address what information, including planned actions and regulatory commitments, licensees should develop and describe in their submittals.

Activity 2.b. in the COMSECY-15-0019 action plan involves the development and issuance of guidance to support decisionmaking related to plant-specific regulatory actions related to reevaluated flood hazard estimates. COMSECY-15-0019 and the letter dated September 1, 2015, from the Director of NRR to licensees (ADAMS Accession No. ML15174A257) provide the basic framework for determining what, if any, regulatory actions are warranted based on the reevaluated estimates of flooding hazards for operating nuclear power plants. The September 1, 2015, summarized the final steps for closure of Recommendation 2.1 activities as follows:

A limited number of sites are expected to require a revised integrated assessment of flooding hazards. Guidance for performing a revised integrated assessment is expected to be issued in 2016. The guidance for revised integrated assessments will continue to allow licensees to use those mitigating strategies that are protected from the reevaluated hazard. The process will continue to focus on potential cliff-edge effects and will afford licensees the option to demonstrate that vulnerabilities identified may be less risk significant when more realistic assumptions are applied in the analyses. The revised integrated assessments will provide information about the flooding hazard and plant response (including existing, new, or proposed capabilities) yielding important quantitative and qualitative risk insights that licensees and the NRC staff will use to support safety and regulatory decisions (referred to as Phase 2 in the 50.54(f) letter). Factors that will be considered may include available warning time to help define the plant mode and needed cooling capabilities, risk reduction measures taken by the licensee, and protective actions (e.g., evacuations) to limit possible health consequences of the identified flooding scenarios at the subject site. The NRC staff will review the results of the integrated assessment to determine if licensees can address identified plant vulnerabilities appropriately or if a plant-specific backfit evaluation of potential regulatory actions should be undertaken in accordance with established processes such as NRC Management Directive (MD) 8.4, "Management of Facility-specific Backfitting and Information Collection." The integrated assessments are expected to be completed by December 2018.

The remaining portions of this enclosure provide additional details regarding how NRC staff will implement the framework described above using information provided by licensees for reevaluated flooding and seismic hazards, actions taken to address the reevaluated flooding and seismic hazards, and by leveraging the NRC's existing risk-informed regulatory framework and processes.

3. INFORMATION SUPPORTING REGULATORY DECISIONMAKING

A) *Flooding*

The NRC staff has endorsed, with appropriate exceptions and clarifications, industry guidance for licensees to use for performing flood hazard reevaluations. The guidance for flooding focused evaluations and integrated assessments is provided in NEI 16-05, "External Flooding Assessment Guidelines," and JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flooding Hazard Reevaluation; Focused Evaluation and Integrated Assessment." These guidance documents describe acceptable methods for performing the requested integrated assessment for external flooding described in the 10 CFR 50.54(f) letter and the focused evaluation described in COMSECY-15-0019. Staff will review licensees' integrated assessments and focused evaluations and apply engineering and operational judgement to assess the appropriateness of licensee evaluations and actions. No further regulatory action will be considered for sites that perform a focused evaluation and demonstrate appropriate plant protection to address the reevaluated flooding hazards (including any necessary regulatory commitments). Integrated assessments are completed for flood mechanisms (other than local intense precipitation) if the licensee cannot demonstrate that available physical margin is adequate, credited protection features are reliable, or the site response for protection is adequate.

NEI 16-05 describes five paths for performing integrated assessments and focused evaluations. Paths 1 involves refinement to the flooding hazard, Paths 2 and 3 relate to focused evaluations, and Paths 4 and 5 relate to integrated assessments. Path 4 in NEI 16-05 describes how to demonstrate an effective mitigation strategy which uses SSCs, mitigation equipment, and manual actions to maintain or restore key safety functions. Path 5 describes how to define multiple scenarios for the flood mechanisms that are not bounded by the design-basis flood hazard and demonstrate an adequate response strategy for each scenario. The integrated assessment submittals will include evaluations related to various flooding mechanisms, an estimated timeline and associated time sensitive actions, descriptions of existing capabilities to deal with the scenarios, and possible regulatory commitments for new or enhanced capabilities. In addition, a risk insight of particular importance is the frequency of a consequential flooding event. The guidance in NEI 16-05 directs licensees to provide a discussion (quantitative or qualitative) of the likelihood of a flood that could exceed flood protection features and challenge a key safety function. The NRC endorsed guidance includes a graded approach based on the above factors and includes consideration of effective flood protection and mitigation.

B) *Seismic*

Plants whose reevaluated seismic hazard ground motion response spectra exceeds the licensing basis safe shutdown earthquake in the 1-10 Hz range and does not meet the criteria for low seismic hazard or narrow band exceedance are expected to perform a seismic risk assessment using either an enhanced SMA or an SPRA approach. SPRA, the preferred approach and the approach being used by all affected licensees, uses SSC fragility calculations integrated with seismic hazard analysis to quantify risk by calculating the frequencies of severe core damage and radioactive release based on plant-specific logic models and accident sequences. An SPRA will provide decisionmakers with quantitative results, such as core

damage frequency and large early release frequency, considering a full range of distribution and uncertainties. The seismic margins assessment uses systems analysis to develop a plant model that is used to develop high confidence of low probability of failure capacity values. Both approaches ultimately lead to the identification of SSCs most likely to contribute to core damage or large early release. Licensees will report the list of significant contributors and any actions planned or taken.

Similar to the flooding hazard reevaluations, the industry and staff have developed guidance on acceptable methods for satisfying the requested risk evaluation for seismic event described in the 10 CFR 50.54(f) letter. These guidance documents describe methods for SPRA risk quantification and identification of significant contributors to risk (i.e., seismic core damage frequency and seismic large early release fraction). Guidance is provided in EPRI Report 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near Term Task Force Recommendation 2.1: Seismic;" JLD-ISG-2012-04, "Guidance on Performing a Seismic Margin Assessment in Response to the March 2012 Request for Information Letter," and EPRI Report 3002004396, "High Frequency Program: Application Guidance for Functional Confirmation and Fragility Evaluation." The NRC endorsed the guidance in SPID and EPRI Report 3002004396 by letters dated February 15, 2013 (ADAMS Accession No. ML12319A074), and September 17, 2015 (ADAMS Accession No. ML15218A569), respectively.

4. DECISIONMAKING APPROACH FOR FLOODING AND SEISMIC HAZARD REEVALUATIONS

A) Senior Management Review Panel

The NRC staff will assess the information provided for those plants completing a flooding integrated assessment or SPRA to determine whether: (1) the licensee's response to the 10 CFR 50.54(f) letter has demonstrated that no further regulatory actions are necessary, or (2) consideration of the need for additional regulatory actions under the NRC's backfit regulation is warranted. The NRC staff plans to use the key principles in NRR OI LIC-504, "Integrated Risk-Informed Decision-Making Process for Emergent Issues," in conducting this assessment. The office instruction discusses the following key principles:¹

- Compliance with existing regulations
- Consistency with the defense-in-depth philosophy
- Maintenance of adequate safety margins
- Demonstration of acceptable levels of risk
- Implementation of defined performance measurement strategies

¹ The same key principles are also described in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Various risk-informed processes generally differ in the manner by which they demonstrate that the key principles are satisfied. When NRR OI LIC-504 is employed, the five key principles are used to differentiate among various options for resolving the issue. NRR OI LIC-504 describes the contrast of assessing the key principles for this purpose versus their use in RG 1.174, which is used for licensee-proposed changes to NRC requirements.

The consideration of both quantitative and qualitative factors lends itself to the panel-based option described in NRR OI LIC-504. The NRC staff is therefore establishing a temporary Senior Management Review Panel to support the assessment of licensee-provided information and related NRC staff evaluations of the integrated assessments and SPRAs. The Senior Management Review Panel will consist of the directors of NRR's Japan Lessons-Learned Division, Division of Risk Assessment, and Division of Operating Reactor Licensing. Additional support may be solicited from other NRR divisions, the Division of Site Safety and Environmental Analysis in NRO, or other NRC offices, as needed to assess specific plants or scenarios. The Senior Management Review Panel will be supported by appropriate technical staff, who will be responsible for consolidating relevant information and developing recommendations for consideration of the panel.

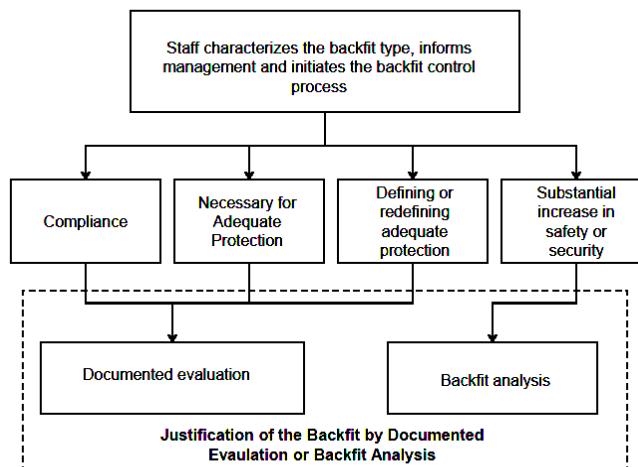
Because they are rare events and there is varying degrees of understanding of the phenomena, the consideration of uncertainty is an important factor in assessing the impact of natural hazards on nuclear power plants. In addition, the data that support these models are limited and represent large degrees of natural variability. As originally promulgated, the quantitative safety goals represent mean estimates of a distribution of results. In applying these estimates to regulatory decisions, the Commission is careful to recognize that "that proper attention be given not only to the range of uncertainty surrounding probabilistic estimates, but also to the phenomenology that most influences the uncertainties." The Senior Management Review Panel will consider these uncertainties as part of its decisionmaking.

The Senior Management Review Panel is expected to meet and reach a decision for each plant submitting an integrated assessment or SPRA. The panel's primary decision is whether the licensee has provided sufficient information and rationale for closing out the 10 CFR 50.54(f) request for information, or if safety concerns remain that necessitate the need for consideration of additional regulatory actions under the NRC's backfit regulation. The panel will consider generic and hazard-specific factors, such as available warning time (in the case of flooding hazards), risk reduction measures taken by the licensee, and protective actions (e.g., evacuations) to limit possible health consequences of the identified flooding and seismic hazards at a given site. In addition, as discussed above, the frequency of the hazard is also an important factor for consideration of the panel; the panel may conclude that additional regulatory actions should be considered in cases where it determines that a relatively frequent hazard poses an undue risk to public health and safety. Finally, the panel will ensure that the Commission's direction on the use of qualitative factors in regulatory decisionmaking is implemented.

The panel will ensure that the basis for its decision is appropriately documented, consistent with the guidance in NRR OI LIC-504. A closeout letter will be issued to the licensee if the panel decides that the information required by the 10 CFR 50.54(f) letter has been provided and that additional actions are unlikely to result in the need for additional regulatory action. The panel may also direct the NRC staff to undertake further evaluation of potential regulatory actions, as described below, if those actions might lead to substantial additional overall protection.

B) Backfitting

If the review of the information provided by licensees in response to the 10 CFR 50.54(f) letter indicates that additional regulatory action imposing a change is likely to result in substantial increase in safety, the NRC staff will identify and assess the potential change. Potential additional regulatory actions could require changes to procedures; operations; structures, systems, and component; or other actions to improve the protection or mitigation beyond-design-basis external events. The staff may also consider requiring the escalation of the regulatory treatment of an issue from one tier of the licensing basis (e.g., regulatory commitment) to another tier (e.g., regulatory requirement). In either of these situations, the evaluation of possible regulatory actions to be imposed on licensees of operating nuclear power plants is governed by NRC's backfit regulation. Guidance for conducting backfit assessments is provided in MD 8.4; NRR OI LIC-202, "Procedures for Managing Plant-Specific Backfits and 50.54(f) Information Requests;" and related references, such as NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission." Following the identification of a possible plant-specific backfit, Exhibit 1 to MD 8.4 shows the next step in the process to characterize the backfit type. The related portion of Exhibit 1 is shown below:



The staff has acknowledged that in most cases, actions to address the reevaluated seismic and flooding hazards are not a matter of compliance with existing requirements². This position was described in letters to licensees dated March 1, 2013 (flooding), and February 20, 2014 (seismic), from the Director of NRR and is also reflected in the action plan submitted to and approved by the Commission in COMSECY-15-0019.

² The Statements of Consideration for the Backfit Rule (50 FR 38097, 38103, September 20, 1985) stated: "The compliance exception is intended to address situations in which the licensee has failed to meet known and established standards of the Commission because of omission or mistake of fact. It should be noted that new or modified interpretations of what constitutes compliance would not fall within the exception and would require a backfit analysis and application of the standard."

The NRC maintains the ability to find that plant changes are needed to provide reasonable assurance of adequate protection of public health and safety. Using the guidance described below, the staff will determine if a substantial increase in safety could be achieved by possible changes to plants or procedures. If these evaluations uncover a significant safety concern, the staff may choose to pursue imposition of a backfit using the adequate protection provision, with a documented evaluation, and forgo the backfit analysis. The Commission has not directed the staff to redefine adequate protection to address the Fukushima-related recommendations and so the staff is not considering characterizing the potential backfits addressing seismic or flooding hazard reevaluations using that exception to performing a backfit analysis.

The purpose of a backfit analysis is to determine formally:

- 1) if a substantial increase³ in the overall protection of the public health and safety or the common defense and security is to be derived from implementing the backfit, and
- 2) if the direct and indirect costs of implementing the backfit for that facility are justified in view of the increased protection.⁴

The existing guidance available in references such as NUREG/BR-0058 provides some instruction and insights for the backfit analyses for reevaluated external hazards. In the context of NRC's risk-informed regulatory framework, NUREG/BR-0058 describes a safety goal evaluation, which can be used for "determining whether the substantial added protection standard of 10 CFR 50.109(a)(3) is met." Safety goal evaluations are based on the following broad guidelines:

- Safety goal screening criteria are to be applied only to safety enhancements and evaluated for the affected class of nuclear power plants. Safety goals are to be used as a reference point in ascertaining the need for safety enhancements.

³ In the statement of considerations for the 1985 reactor backfitting rule, the Commission stated that substantial means "important or significant in a large amount, extent, or degree." Under such a standard the Commission would not ordinarily expect that safety improvements would be required as backfits that result in an insignificant or small benefit to public health and safety or common defense and security, regardless of costs. On the other hand, the standard is not intended to be interpreted in a manner that would result in disapprovals of worthwhile safety or security improvements having costs that are justified in view of the increased protection that would be provided (50 FR 38097, 38102, September 20, 1985)

⁴ The Commission also addressed the question of imposing requirements to provide or enhance "defense-in-depth." The Commission stated that backfits "should not be disapproved or approved based solely on the presence or absence of another line of defense to cope with the failure of the first. For example, safety improvements in the integrity of the reactor coolant system should not be dismissed merely because an emergency core cooling system has been provided to protect public health and safety with high confidence in the event that the integrity of the reactor coolant system is lost. On the other hand, such a suggested improvement may be precluded because it does not meet the substantial test, or does not increase overall protection provided by the plant due to, for example, the negative impacts on other aspects of the plant. The proposed requirement that the costs of backfits be considered and justified in view of the increased protection to public health and safety or security is based on the Commission's view that it should, in these circumstances, consider the direct and indirect costs of implementation in making safety decisions under the Atomic Energy Act."

However, the safety goals are not requirements and, with the Commission's approval, safety enhancements may be implemented without strict adherence to the Commission's safety goal policy statement.

- Safety goal evaluations are to be performed in conjunction with the substantial additional protection criterion contained in the backfit rule (10 CFR 50.109(a)(3)) and applied to 10 CFR 50.109 analyses associated with substantial safety enhancements wherein the costs of the implementation are justified in view of the safety improvement to be realized.
- Evaluations of proposed regulatory initiatives for consistency with safety goals should identify and integrate related issues under study. Integration of related issues is essential to the efficient application of staff and industry resources. The overall objective is to avoid piecemeal evaluation of issues.

NUREG/BR-0058 provides the following guidance regarding estimated reduction in core damage frequency (CDF) of the proposed new requirement when prevention of core damage is being used as the subsidiary goal (e.g., first screening of possible changes to the plant licensing basis to address some seismic or flooding hazards):

Estimated reduction in CDF	Staff Action
> 10^{-4} /reactor year	Proceed with the regulatory analysis on a high-priority basis.
Between 10^{-4} and 10^{-5} /reactor year	The decision whether to proceed with the regulatory analysis is to be made by the responsible division director.
< 10^{-5} /reactor year	Terminate further analysis unless the office director decides otherwise based upon strong engineering or qualitative justification.

NUREG/BR-0058 provides guidance for assessing issues that involve not only prevention of core damage, but also include possible changes to containment performance. To achieve a measure of balance between prevention and mitigation, the safety goal screening criteria established for safety goal evaluations include a mechanism for having greater consideration of issues, and associated accident sequences, with relatively poor containment performance. The guidance recognizes that in certain instances, the screening criteria may not adequately address certain accident scenarios of unique safety or risk interest. In these circumstances, the analyst should provide justification for why the screening criteria do not apply and the decision to pursue the issue should be subject to further management decision.

If it is not possible to develop adequate quantitative supporting information for a proposed new requirement, NUREG/BR-0058 states that a qualitative analysis and perspectives should be provided. To the extent practical, these points and insights should be related to the safety goal screening criteria.

However, as discussed in COMSECY-15-0019, additional clarifications and guidance specific to the external hazard reevaluations would be helpful for the NRC and licensees. Such guidance can support improving the effectiveness and efficiency of NRC evaluations by making it clearer when the activities associated with the 10 CFR 50.54(f) letters can be closed. Rather than using a refined assessment, other Fukushima-related recommendations have been evaluated using high-level conservative estimates of plant risks to expedite the safety-goal screening process. This process involves the use of:

- A conservative estimate of the frequency of the seismic event or consequential flooding event
- A conservative estimate of the likelihood that the seismic or flooding event would result in the loss of key safety functions
- A conservative estimate of the success/failure probability of mitigating strategies, given a specific event, including consideration of factors such as warning time
- Consideration of containment performance and the use of Severe Accident Management Guidelines to limit radiological impact from an accident
- Conditional individual latent cancer fatality (ILCF) risk in the case core damage and off-site release occurs
- Conservative estimate of frequency-weighted ILCF risk

The evaluation tool can be used to shorten the backfit analysis if the staff concludes that a possible backfit would not provide a substantial safety improvement. If an assessment determines that a possible backfit could provide a substantial safety improvement, the staff will follow the guidance in NRR OI LIC-202 and MD 8.4 for comparing the benefits and costs associated with the proposed backfit. If the backfit analysis demonstrates a cost-justified substantial enhancement and no clearly preferable alternative is available to the proposed action, the staff will initiate the management approval process for a plant-specific backfit. The backfit analysis must be approved by the appropriate managers in NRR and copies provided to the Office Director and the EDO before the analysis is transmitted to the licensee. If, at any time, the backfit analysis shows that a backfit identified by the staff is not justified because of the lack of substantial additional overall protection or justification of the direct and indirect costs of implementation, the issue may be closed. In that case, the staff will inform management of the finding and proceed with the closure of the related 10 CFR 50.54(f) letter for the subject plant.