

# **Near-Term Task Force Recommendations 2.1 and 2.3**

## **Purpose and Scope**

# Event and NRC Response



- March 11: Earthquake and Tsunami
- March 30: Near-Term Task Force Charter
- July 12: NTTF Report Issued
  - 12 overarching recommendations
- September 9: Recommendations to Initiate
  - SECY 11-0124
  - October 18: SRM. Commission approved staff's proposed actions in SECY, subject to comments
- October 3: Staff Prioritization
  - SECY 11-0137
  - Commission direction pending

# Recommendation 2.1

# Recommendation 2.1

## SCOPE

### Two Phases:

- Phase 1: Issue generic 50.54(f) letters to all licensees to reevaluate the seismic and flooding hazards at their sites against present-day regulatory guidance and methodologies used for ESP and COL reviews.
- Phase 2: If necessary, update the design basis and SSCs important to safety to protect against the updated hazards.

# Recommendation 2.1

## SRM SECY 11-0124 Comments:

- For Recommendation 2.1, when the staff issues the... 10 CFR 50.54(f) to identify actions that have been taken or are planned to address plant-specific vulnerabilities..., the staff should explain the meaning of ‘vulnerability.’
- The staff should inform the Commission...when it has developed the technical bases and acceptance criteria for implementing Recommendations 2.1, 2.3, and 9.3.

# Recommendation 2.1

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## SECY 11-0124: FLOODING

“Initiate stakeholder interactions to discuss application of present-day regulatory guidance and methodologies being used for ESP and COL reviews to the reevaluation of flooding hazards.”

# Recommendation 2.1

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## SECY 11-0124: SEISMIC

“Continue stakeholder interactions to discuss the technical basis and acceptance criteria for conducting a reevaluation of site specific seismic hazards. This would include implementation considerations of the hazard and risk methodologies described in draft Generic Letter (GL)...(ML111710783)” related to GI-199.

# Recommendation 2.1

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## General:

- Two 50.54(f) letters will be developed in Phase 1
  - Seismic Hazards
  - Flooding Hazards
- Although the technical details will be different, an effort will be made to define recommendation-specific terms, such as vulnerability, in a similar way.



# Recommendation 2.3

# Recommendation 2.3

## SCOPE

Develop and issue a request for information to licensees pursuant to 10 CFR 50.54(f) to:

- 1) develop a methodology and acceptance criteria for seismic and flooding walkdowns to be endorsed by the staff following interaction with external stakeholders,
- 2) perform seismic and flood protection walkdowns to identify and address plant-specific vulnerabilities (through corrective action program) and verify the adequacy of monitoring and maintenance for protection features, and
- 3) inform the NRC of the results of the walkdowns and correction actions taken or planned.

# Recommendation 2.3

## SRM SECY 11-0124 Comments:

The staff should inform the Commission...  
when it has developed the technical bases and  
acceptance criteria for implementing  
Recommendations 2.1, 2.3, and 9.3.

# Recommendation 2.3

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## SECY 11-0124: SEISMIC

“Recent plant inspections by staff in accordance with Temporary Instruction 2515/183...and licensees’ plant inspections in response to the Fukushima Daiichi accidents will help inform the implementation of this recommendation.”

# Recommendation 2.3

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## SECY 11-0124: FLOODING

“Results of staff’s inspections at nuclear power sites in accordance with Temporary Instruction 2515/183 identified potential issues and observations regarding mitigation measures.”

# Recommendation 2.3

## SECY 11-0137

Use existing guidance and recent site-specific events to inform implementation:

– Seismic

- EPRI Report NP-6041-SL Revision 1
- SQUG GIP procedure for Seismic Verification of NPP Equipment
- IAEA Safety Guide NS-G-2.13
- Recent Mineral, VA earthquake and associated inspections.

– Flooding

- Flood events at NPP sites, associated inspections, and temporary flood mitigation measures.

Note: SECY 11-0137 is pending Commission direction

# Recommendations 2.1 & 2.3

# Recommendations 2.1 & 2.3

## NRC's Plans of Action

- Summarize Scope
- List Key Considerations to be Addressed
  - NRC's Generic Issues Program Items
  - Reconcile recent site-specific events to inform process
  - Deliverables and Guidance to meet Scope
  - Site-specific data needs
  - Technical implementation issues
  - Evaluation of other International Documents



# Strategies for Timely Responses and Reviews

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- Many challenges exist (e.g., available & skilled resources).
- Strategies are needed to provide timely, high quality, and uniform responses and, to expedite staff's review
- Examples of strategies to consider:
  - Develop a response and review prioritization for sites
  - Phased approach and phased submittal of information
  - Develop templates to aid high quality and uniform responses
  - Develop joint solution approach for similar issues (e.g., generic fragilities used by plants with similar designs)
  - Dedicated teams for plant walkdowns
  - Initiate training to build skilled resource pool

# Recommendations 2.1 & 2.3

## SCHEDULE

- I. Develop 10 CFR 50.54(f) letter**
  - 6 months for Seismic (April 2012)
  - 8 months for Flooding (June 2012)
- II. Evaluate licensee responses to 10 CFR 50.54(f) letter**
  - Schedule to be determined
- III. Issue orders to licensees (if needed)**
  - 3 months following decision to issue orders
- IV. Conduct inspection activities**
  - Schedule to be determined
- V. Issue letters to close out 10 CFR 50.54(f) letter and/or orders**
  - 1 month after last inspection

# Recommendations 2.1 & 2.3

## SCHEDULE (cont)

Time is short!

Propose we set meeting agenda and dates:

- Topics
  - Key concepts
  - Technical implementation issues
  - Associated guidance
  - Overall approach and process
- Industry White Papers

# Surface Water Flooding

Jill Caverly

# Present Day Regulatory Framework, Guidance and Methodologies



## Regulations:

- 10 CFR Part 100 – identifying and evaluating hydrological features of the site.
- 10 CFR Part 50 Appendix A, GDC 2 - Design Basis for Protection Against Natural Phenomena
  - “Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions.”
- 10 CFR Part 52 : [52.17(a)(vi) for ESP and 52.79(a)(1)(iii)for COL] – identifying hydrologic characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena historically reported.

## Regulatory Guides:

- NUREG-0800: SRP 2.4
- RG 1.59: Design Basis Floods for Nuclear Power Plants
- ANS 2.8-1992: Determining Design Basis Flooding at Power Reactor Sites
- NUREG/CR – 1704: Design-Basis Flood Estimation for the Site Characterization at Nuclear Power Plants in the USA
- RG 1.102: Flood Protection for Nuclear Power Plants

# Hydrology Safety Review Areas

1	<b>Descriptive Hydrology</b>
2	<b>Historic Flood</b>
3	<b>Local Precipitation /River &amp; Streams Floods</b>
4	<b>Dam Failure</b>
5	<b>Surge &amp; Seiche</b>
6	<b>Tsunami Hazards</b>
7	<b>Ice Effects</b>
8	<b>Cooling Water Canals and Reservoirs</b>
9	<b>Flood Protection</b>
10	<b>Channel Division</b>
11	<b>Low Water</b>
12	<b>Ground Water</b>
13	<b>Effluent Transport</b>



**Analysis completed using a deterministic probable maximum concept**



## 2.4.1 Hydrologic Description

- Interface of Plant with Hydrosphere
- Hydrological Causal Mechanism
- Data (spatial & temporal, site relevant)
- Alternate Conceptual Methods
- Additional site specific information

# Hydrology Safety Review Areas

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## 2.4.2 Floods

- Flood history at the site
- Identification of potential mechanisms for flooding at the site
- Computation of local-intense precipitation
- Local Flooding & Drainage Design
- Combined Events



# Hydrology Safety Review Areas

## 2.4.3 Probable Maximum Flood

### Design Bases for Flooding in Streams & Rivers

- Computation of the PMP over the watershed
- Computation of the PMF maximum water level at the site in combination with other effects (wind wave, surge, etc).

### Design Bases for Site Drainage

- Produced by 2.4.2 local-intense precipitation
- Potential effects of erosion and sedimentation
- Rainfall-runoff processes are modeled to estimate flooding conditions at the site.

## 2.4.4 Potential Dam Failures

- Severe Breaching of an Upstream Dam
- Domino Type or Cascading Dam Failures
- Dynamic Effects on Structures
- Loss of Water Supply due to Failure of Downstream Dam.
- Effects of Erosion and Sedimentation
- Failure of On-Site Water Control or Storage Structure

## 2.4.5 Storm Surge and Seiche

- Probable maximum surge and seiche
- Meteorological Parameters (wind speed & direction, fetch, storm tracks, historical storm events)
- Bathymetry and Hydrographic Characteristics
- Surge and Seiche Water levels
- Wave Action
- Resonance
- Protective Structures

## 2.4.6 Tsunami Hazards

- Probable Maximum Tsunami
- Historical Tsunami Record
- Source Generator Characteristics
- Tsunami Analysis
- Tsunami Water Levels
- Hydrographic and Harbor or Breakwater Influences
- Effects on Safety-Related Facilities

## 2.4.7 Ice Effects

Review areas include:

- Historical ice conditions
- High & low water levels
- Ice forces and blockage
- Consecutive degree days below freezing
- Develop design basis conditions for site
- Ensure that safety-related SSCs and water supply are not affected by ice-induced hazards

# Hydrology Safety Review Areas

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## 2.4.8 Cooling Water Canals and Reservoirs

- The review area includes canals and reservoirs used to transport and impound water supplied to SSCs important to safety.
  
- The review also includes stream channel diversions toward the site, which may lead to flooding.

## 2.4.9 Channel Diversions

- Review of stream channel diversions away from the site, which may lead to loss of safety-related water.
- Review of stream channel diversions toward the site which may lead to flooding.

# Hydrology Safety Review Areas

## 2.4.10 Flooding Protection Requirements

Review safety-related SSCs

- Review type of flood protection
- Review emergency procedures
- Only applies if the design basis flood exceeds the prescribed maximum flood level.



Seismic

Cliff Munson

# Recommendation 2.1 and GI-199

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- SRM directs staff to use draft GL for GI-199 as vehicle for Recommendation 2.1 (NTTF 2.1)
- GI-199 calls for re-evaluation of seismic hazard at operating reactors
  - Seismic hazard characterized by Performance-Based GMRS
  - GMRS to be compared with SSE
  - SMA or SPRA for GMRS greater than SSE
  - SMA and SPRA acceptance criteria

# GI-199 Flow Chart

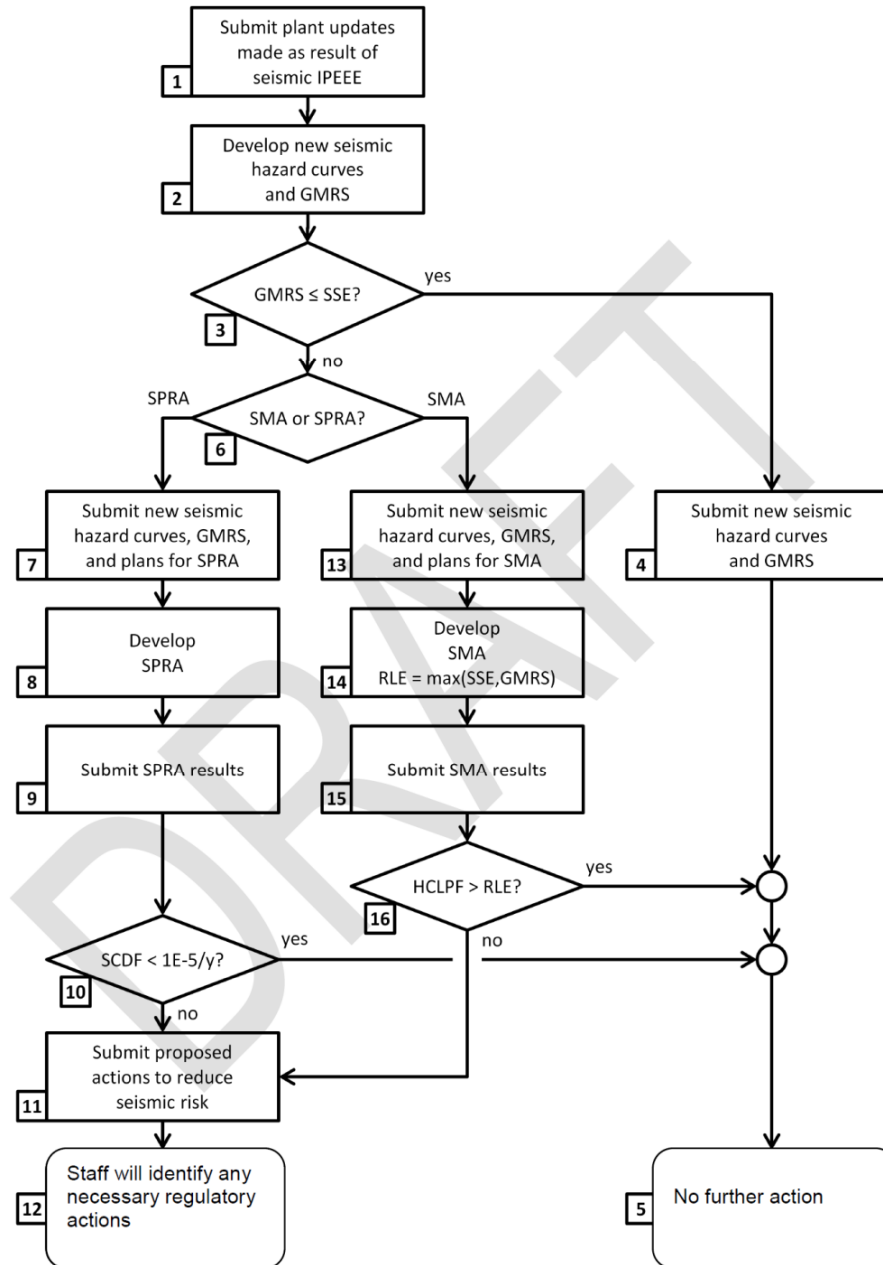


Figure 1. Development of Requested Information and Its Use in Regulatory Analysis.

# GI-199 Issues

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- Limited resources available to perform hazard/risk evaluations
- New CEUS-SSC available for CEUS plants but 4 WUS sites require SSHAC Level 3 models
- Limited site specific soil/rock data to perform response analyses
- Option of SMA or SPRA not hazard/risk informed

# Path Forward – NTTF 2.1



- Based on intermediate GMRS & SSE hazard comparison
  - Provide specific criteria for SMA vs. SPRA
  - Prioritize plants to optimize resources
- Provide more clarification
  - Scope of hazard evaluation (PSHA and Site Response)
  - Risk criteria to determine need for further evaluation or change in design basis
- Provide specificity on schedules

# Recommendation 2.3

- Perform initial walkdown to identify
  - Current conditions post-IPEEE
  - Capacities of additional mitigation systems
- Document results to provide feedback to Recommendation 2.1
- Detailed walkdowns performed later by plants doing SMA or SPRA as part of Recommendation 2.1