



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

**Overview of
Draft Interim Staff Guidance
for the Integrated Assessment
for Flooding**

October 24, 2012

Public Meeting

Near-Term Task Force Recommendations

- **NTTF 2.1:** Order licensees to reevaluate the seismic and flooding hazards at their sites against current NRC requirements and guidance, and if necessary, update the design basis and [structures, systems or components] important to safety to protect against the updated hazards.
- **NTTF 2.3:** Order licensees to perform seismic and flood protection walkdowns to identify and address plant-specific vulnerabilities and verify the adequacy of monitoring and maintenance for protection features such as watertight barriers and seals in the interim period until longer term actions are completed to update the design basis for external events.

Overall Approach

NTTF 2.3 - Walkdowns

NTTF 2.1 Hazard Reevaluations
and Interim Actions

NTTF 2.1 Integrated Assessment
(if required)

Regulatory Actions
(if appropriate)

Near-Term Task Force Recommendations

PHASE 1

STAGE 1

Licenseses Conduct
Flooding Hazard
Reevaluation

Interact with Industry
on Integrated
Assessment Guidance

Licensee submits
Hazard Reevaluation
and Interim Actions

STAGE 2

Licenseses Conduct
Integrated Assessment,
if necessary

Licensee submits
Integrated Assessment
and Additional Actions

PHASE 2

Regulatory Decisions:
* Safety Enhancements
* Backfit Analysis
* Modify Plant License

Purpose of Integrated Assessment

- The Integrated Assessment (IA)
 - evaluates the total plant response to external flood hazards
 - considers both the protection and mitigation capabilities of the plant
 - may use all available resources with appropriate justification
- The purpose of the Integrated Assessment is to
 - evaluate the effectiveness of the current licensing basis against the new hazard analysis using current hazard analysis methods
 - identify plant-specific vulnerabilities
 - assess the effectiveness of existing or planned protection from flood conditions and mitigation of flood consequences for the entire duration of a flooding event

New hazard evaluation, which includes all associated effects of the flood event

Compare new evaluation results to design basis for all flooding mechanisms

Trigger for Performing the NTTF 2.1 Integrated Assessment

Integrated Assessment not required.

Abbreviated Review

- Evaluate site drainage only
- Use sections of new IA ISG
- Document in Hazard Report
- Full IA not required *
- Update licensing basis (Phase 2)

Integrated Assessment

- Use new IA ISG
- Submit Interim Actions with Hazard Report

Flood protection reliable and has margin per the new IA ISG?

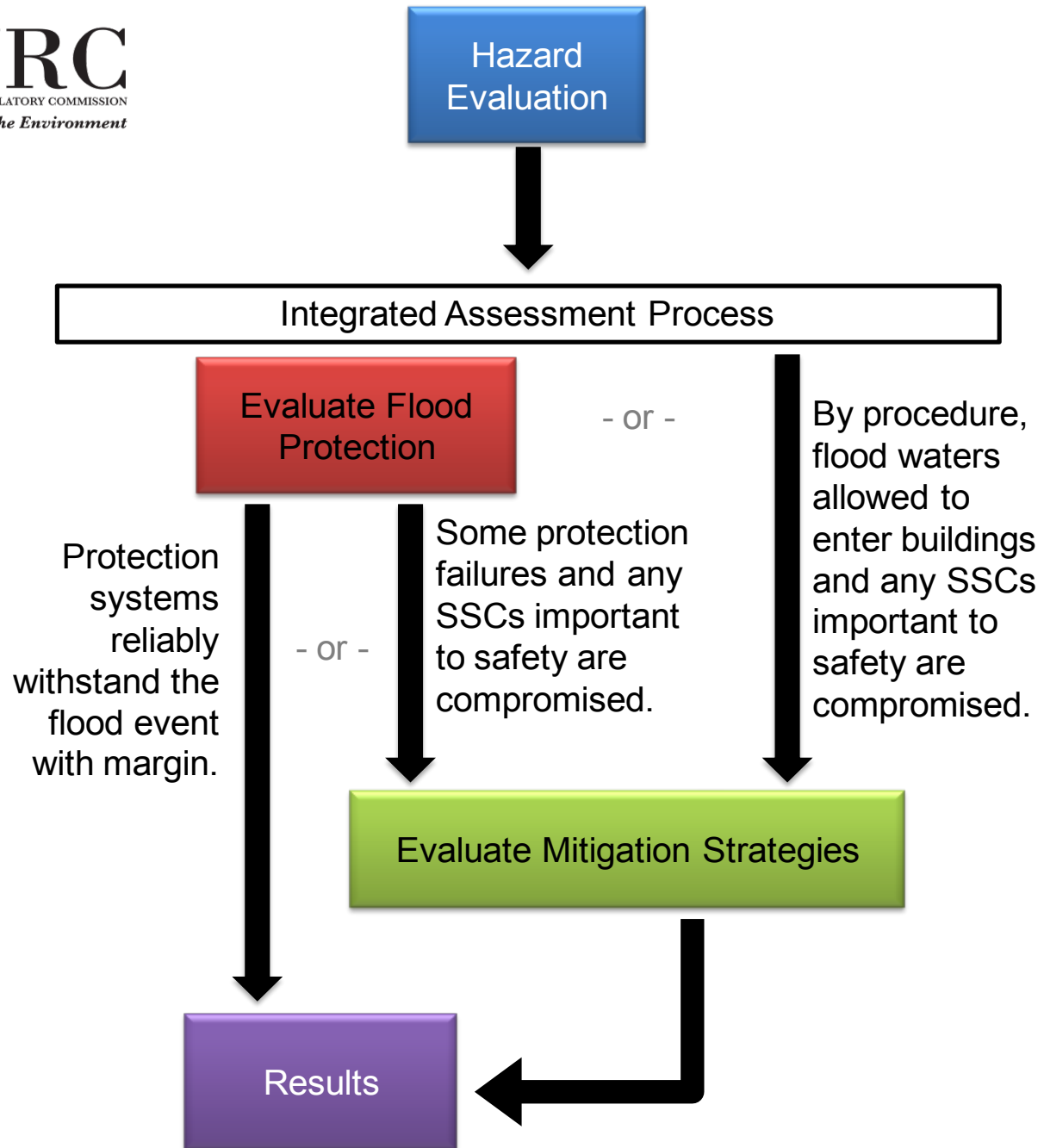
Abbreviated Review

- Evaluate flood protection
- Use sections of new IA ISG
- Document Interim Actions
- Document in Hazard Report
- Full IA not required *
- Update licensing basis (Phase 2)

Integrated Assessment

- Use new IA ISG
- Submit Interim Actions with Hazard Report

* Option exists to perform full IA on normal 2-yr schedule. Hazard report must state if IA is planned.



Content of ISG

1. Introduction
2. Background
3. Framework of Integrated Assessment
4. Peer review
5. Hazard definition
6. Evaluation of effectiveness of flood protection
7. Evaluation of mitigation capability
8. Documentation
9. Terms and definitions
10. Figures
11. References

Appendix A Evaluation of flood protection

Appendix B Peer Review

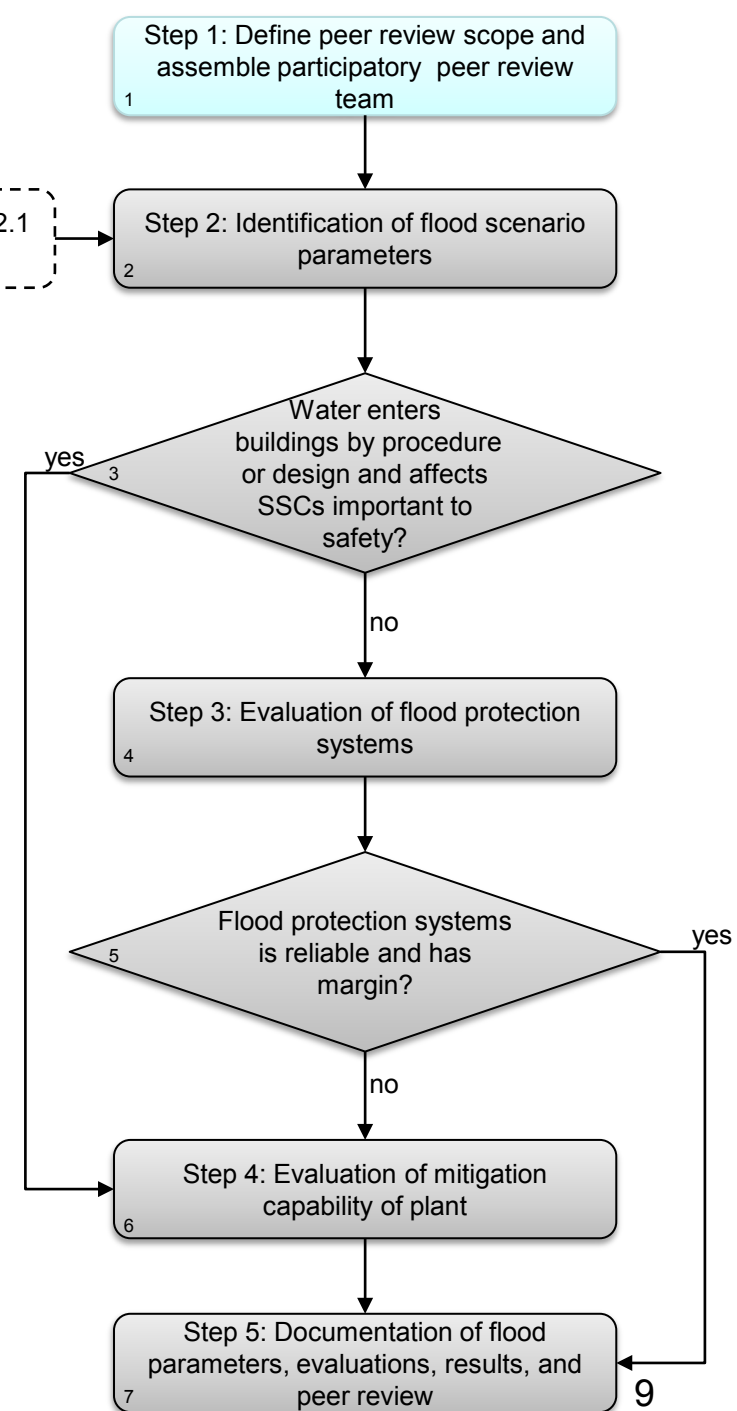
Appendix C Evaluation of operator manual actions

Appendix D Existing resources and examples

Results of NTF Recommendation 2.1 hazard reevaluations

Peer review

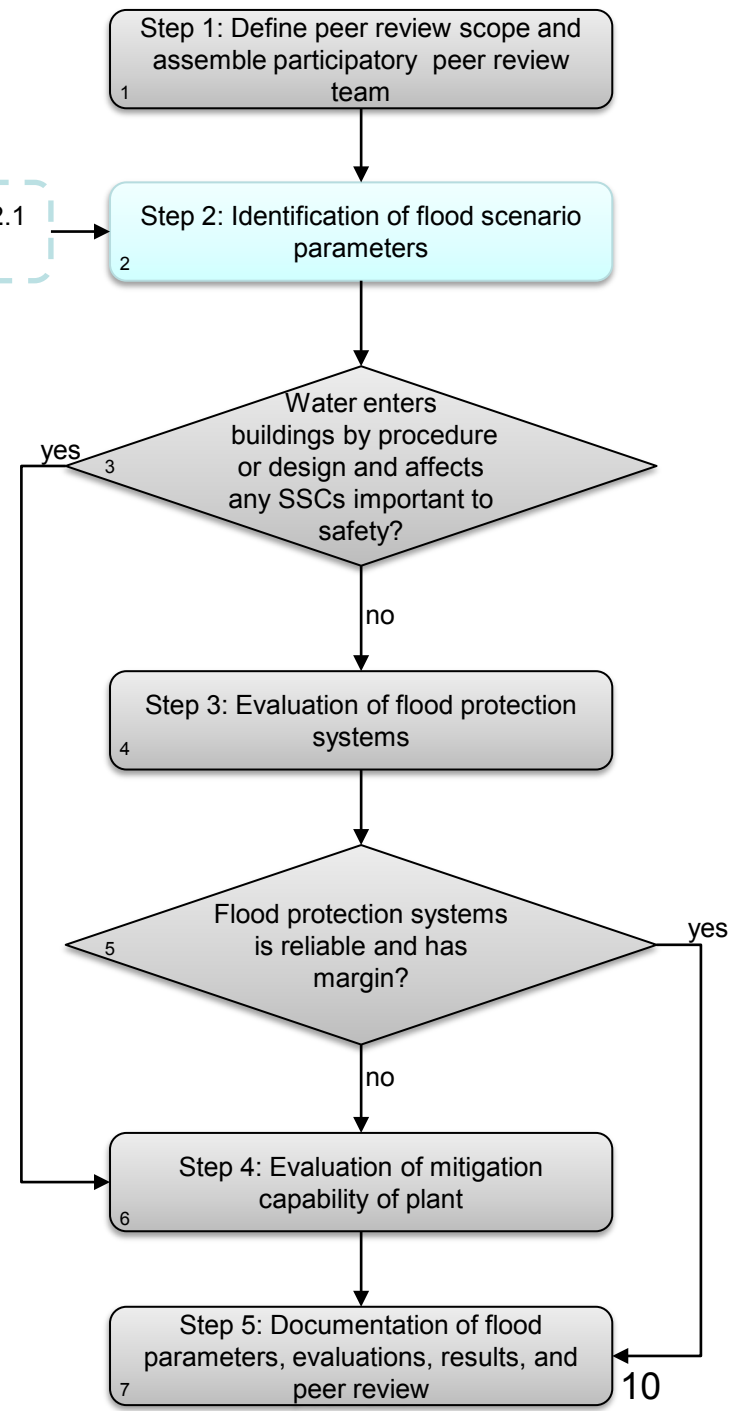
- An independent peer review is an important element of ensuring technical adequacy
 - increases confidence in the results of the Integrated Assessment
 - provides assurance that results form a sound basis for regulatory decisions
- Integrated Assessment uses a graded peer review
 - peer review team may consist of a single reviewer (the peer review team leader)
 - larger peer review team required if flood protection involves temporary protective measures, active components, or operator manual actions and is needed to review judgments made regarding mitigation capability and other facets of the Integrated Assessment



Results of NTTF Recommendation 2.1 hazard reevaluations

Flood scenario parameters

- Flood parameters considered as part of the Integrated Assessment are based on the NTTF 2.1 hazard reevaluations
- Integrated Assessment should be performed for a set or sets of flood scenario parameters defined based on the reevaluations
- The flood scenario parameters that should be defined and considered as part of the Integrated Assessment include:
 - flood height and associated effects
 - flood event duration, including warning time and intermediate water surface elevations that trigger actions by plant personnel until plant is in and can be maintained in safe stable condition
 - plant mode(s) of operation during the flood



Results of NTF Recommendation 2.1
hazard reevaluations

1 Step 1: Define peer review scope and assemble participatory peer review team

2 Step 2: Identification of flood scenario parameters

3 Water enters buildings by procedure or design and affects any SSCs important to safety?

4 Step 3: Evaluation of flood protection systems

5 Flood protection systems is reliable and has margin?

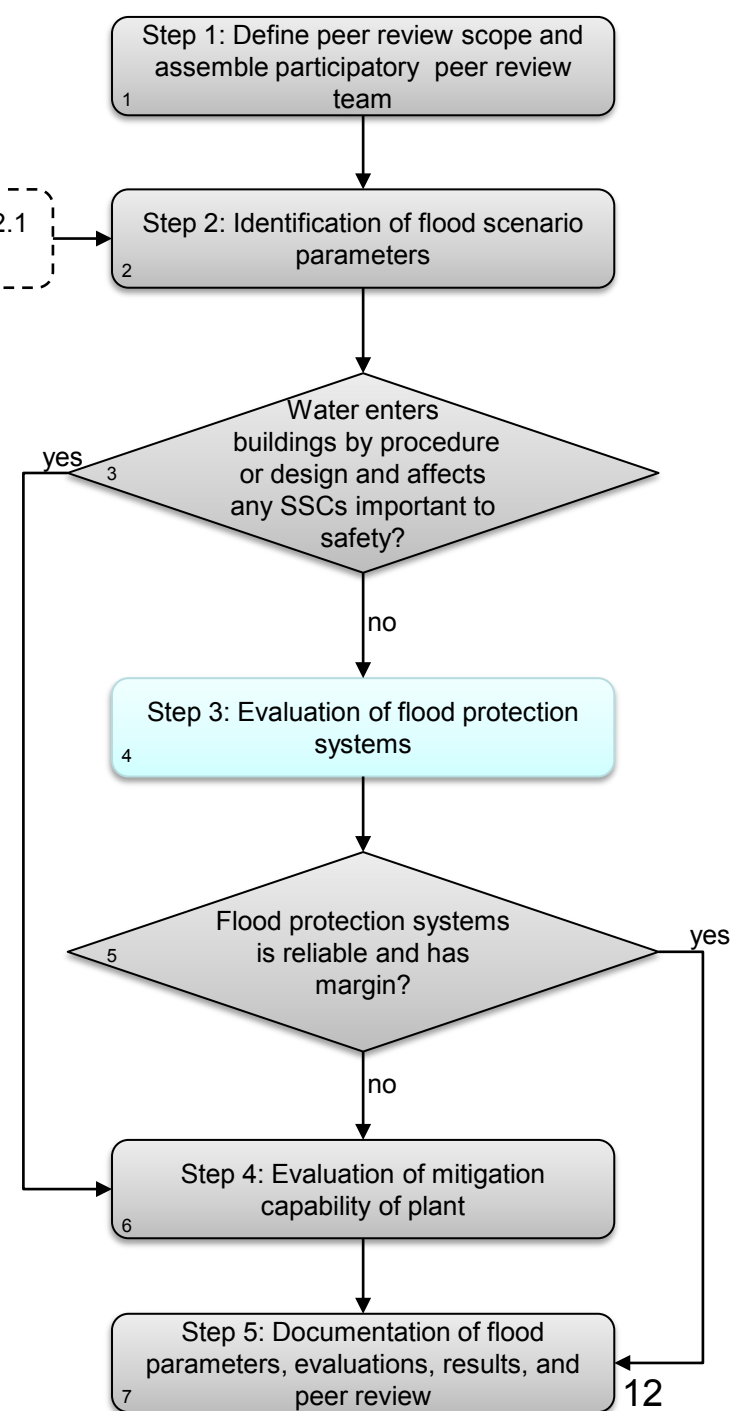
6 Step 4: Evaluation of mitigation capability of plant

7 Step 5: Documentation of flood parameters, evaluations, results, and peer review

Results of NTF Recommendation 2.1 hazard reevaluations

Flood protection evaluation

- An evaluation is performed of the capability of the site flood protection to protect SSCs important to safety from flood height and associated effects for each set of flood scenario parameters
- Flood protection is evaluated against qualitative and quantitative performance criteria to provide confidence in the reliability and margin of flood protection
- Evaluation should document available margin with respect to:
 - physical barrier dimensions
 - structural or other performance capacity
 - time and staffing associated with performance of manual actions



Results of NTF Recommendation 2.1 hazard reevaluations

1 Step 1: Define peer review scope and assemble participatory peer review team

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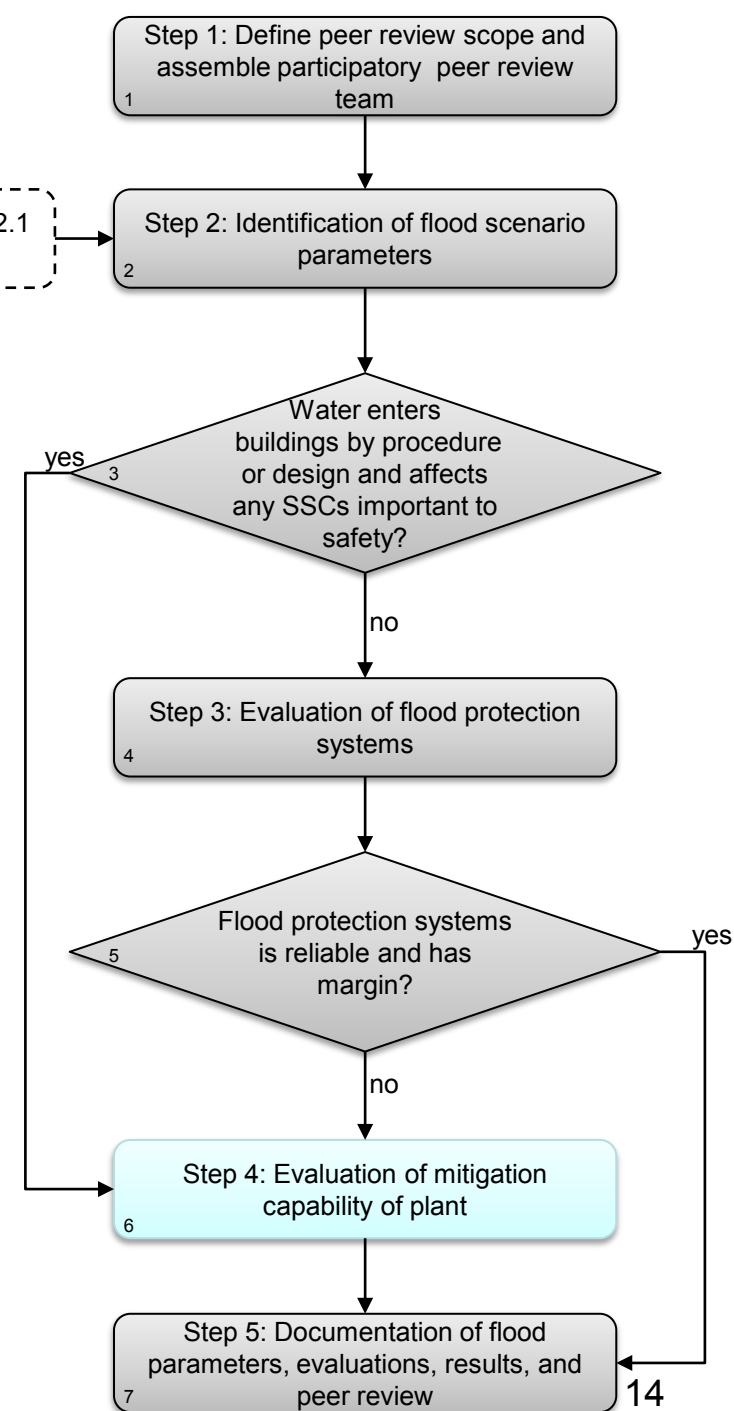
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7 Step 5: Documentation of flood parameters, evaluations, results, and peer review

Results of NTTF Recommendation 2.1 hazard reevaluations

Mitigation capability

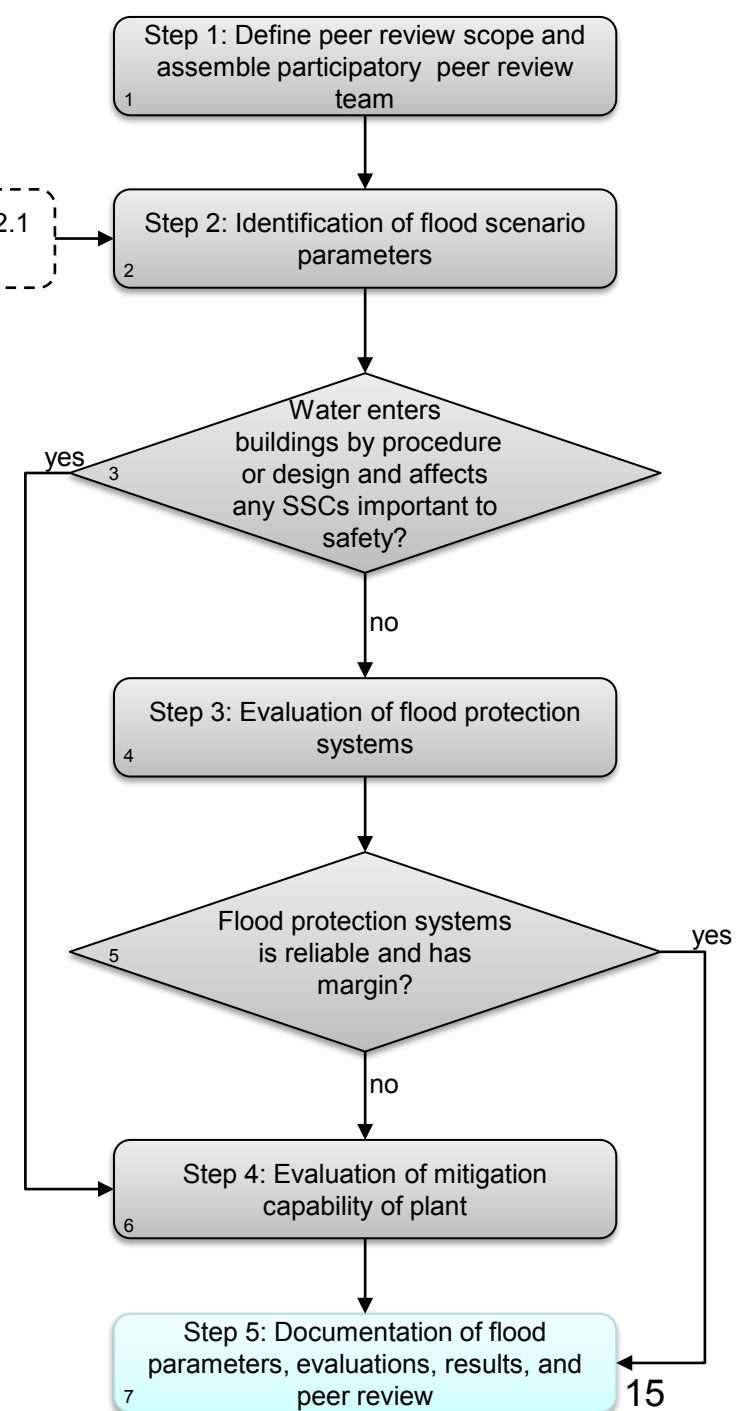
- Mitigation capability refers to the capability of the plant to maintain key safety functions in the event that a flood protection system(s) fails or a site does not have flood protection under the flood scenario parameters.
- Mitigation capability should be evaluated for credible flood protection failure modes, including concurrent failures
- The mitigation capability of a plant may be demonstrated using one of three potential methods, depending on site characteristics and information needed for decisions:
 - scenario-based evaluation
 - margins-type evaluation
 - full PRA



Results of NTF Recommendation 2.1 hazard reevaluations

Documentation

- Consistent with the March 12, 2012 letter, licensees and construction permit holders are requested to provide the following as part of the Integrated Assessment report (Enclosure 2, pp. 8–9):
 - a) *Description of the integrated procedure used to evaluate integrity of the plant for the entire duration of flood conditions at the site.*
 - b) *Results of the plant evaluations describing the controlling flood mechanisms and its effects, and how the available or planned measures will provide effective protection and mitigation. Discuss whether there is margin beyond the postulated scenarios.*
 - c) *Description of any additional protection and/or mitigation features that were installed or are planned, including those installed during course of reevaluating the hazard. The description should include the specific features and their functions.*
 - d) *Identification of other actions that have been taken or are planned to address plant-specific vulnerabilities.*

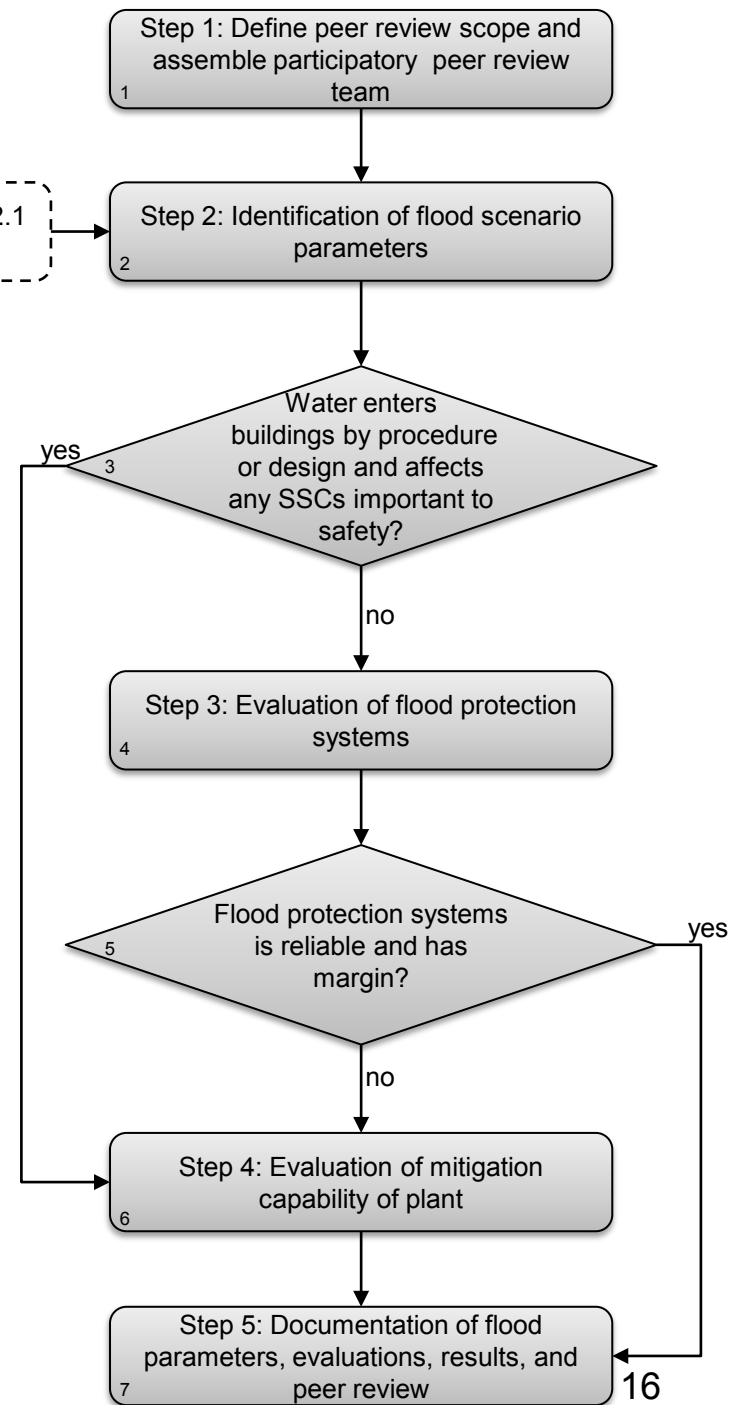


Results of NTF Recommendation 2.1 hazard reevaluations

Appendices

Four appendices have been developed to support the evaluations required as part of the Integrated Assessment:

- Appendix A Evaluation of flood protection
- Appendix B Peer Review
- Appendix C Evaluation of operator manual actions
- Appendix D Existing resources and examples



Status of ISG for Integrated Assessment

- NRC staff is developing the ISG to provide guidance on the performance of the Integrated Assessment
 - Interacted with external stakeholders through multiple public meetings
- Document currently available for public comment
 - Public comment period ends October 29
- NRC staff is working with NEI to develop examples to support the implementation of the Integrated Assessment ISG
- Integrated Assessment ISG scheduled to be issued by November 30, 2012