



U.S. NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Interim Staff Guidance on the Integrated Assessment for External Flooding

ANS Winter Meeting
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Overall Approach: 50.54(f) Letters on March 12, 2012

NTTF 2.3 - Walkdowns

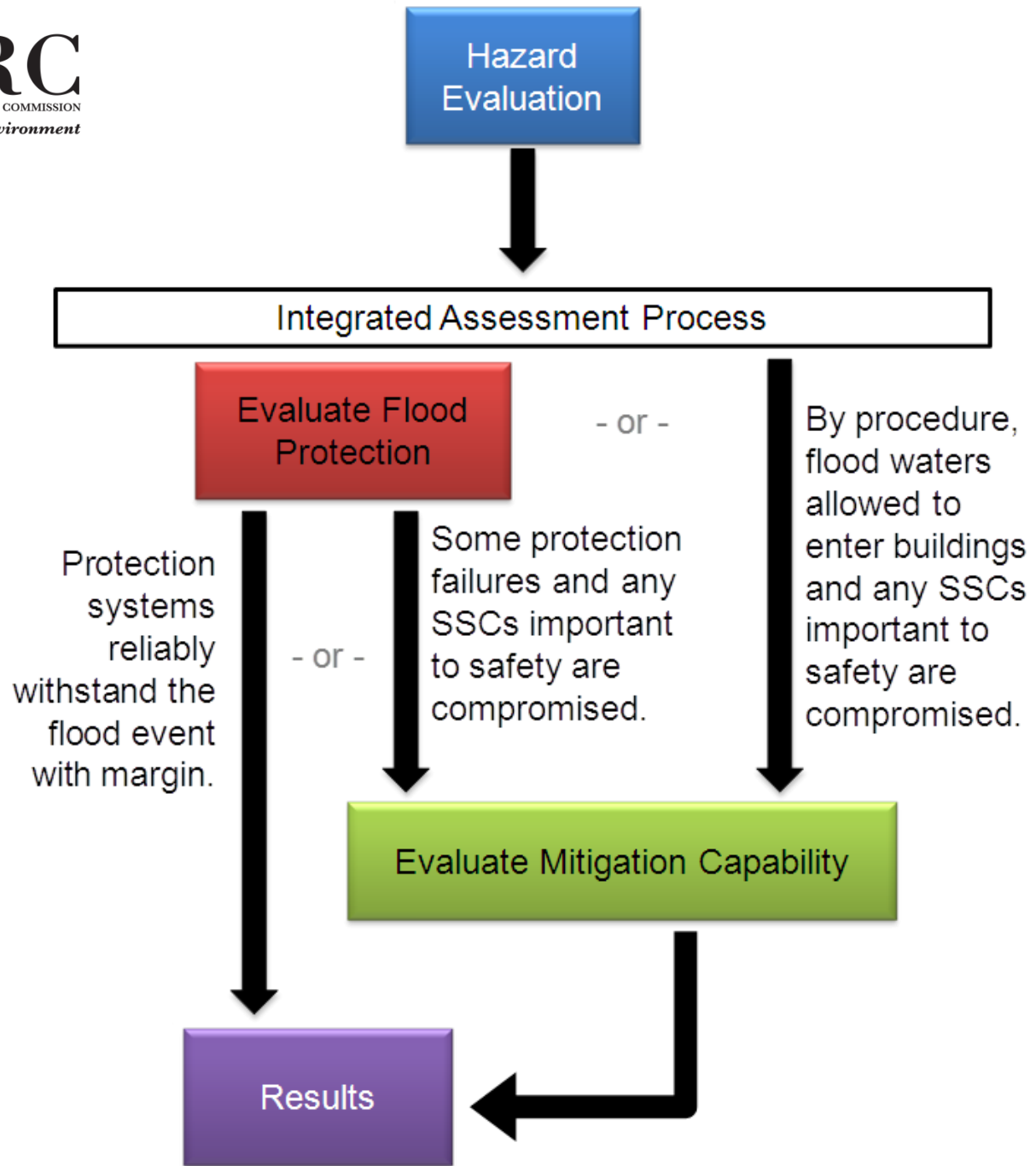
NTTF 2.1 Hazard Reevaluations and Interim Actions
(hazard based on present day guidance/methods)

NTTF 2.1 Integrated Assessment
(if flood design basis does NOT bound reevaluated flood hazard)

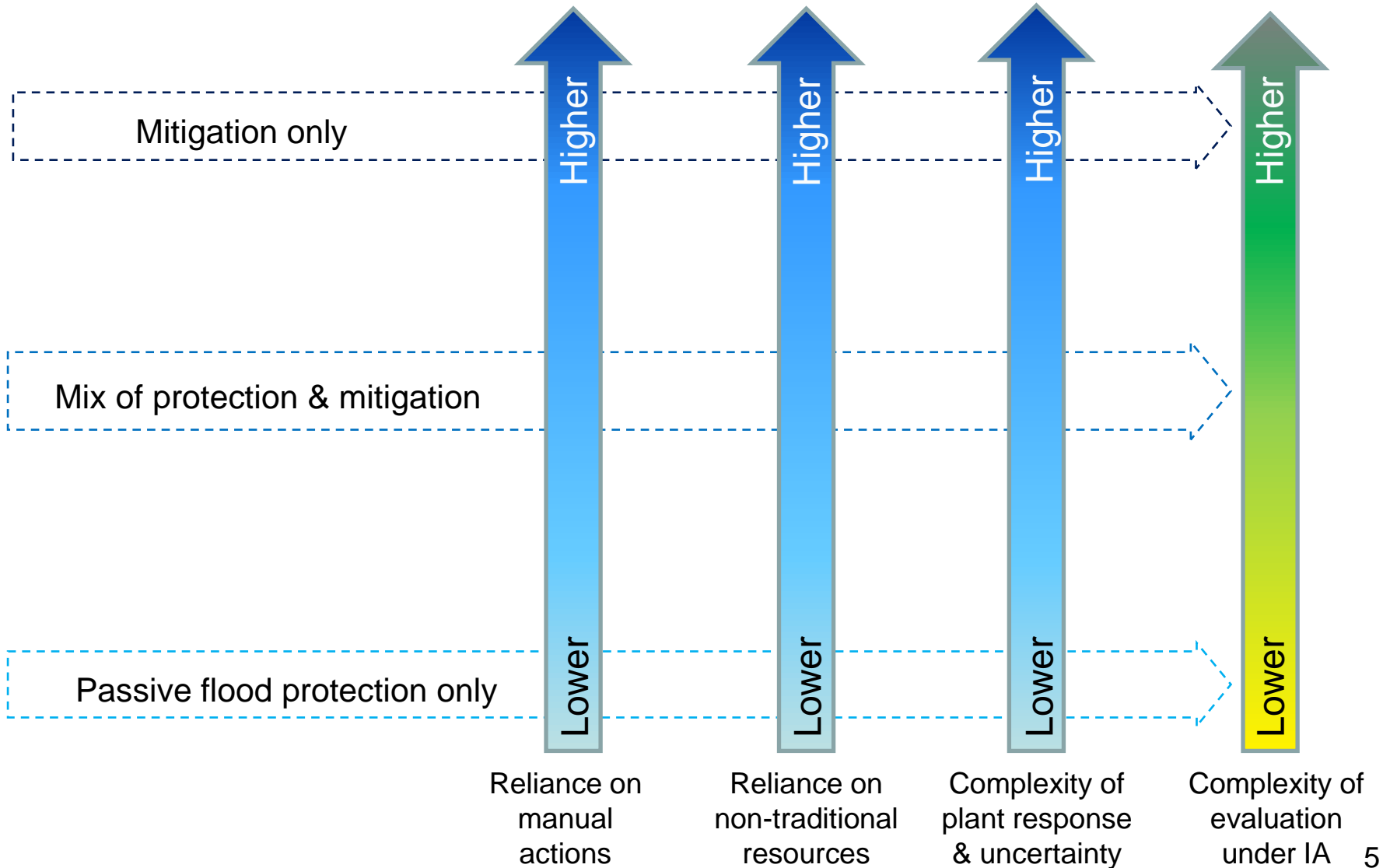
Regulatory Actions
(if appropriate)

Purpose of Integrated Assessment

- The integrated assessment
 - evaluates the total plant response to external flood hazards
 - considers both protection and mitigation
 - 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
 - identify plant-specific vulnerabilities and other important insights
 - assess the effectiveness of existing or planned protection and mitigation for the flood event duration



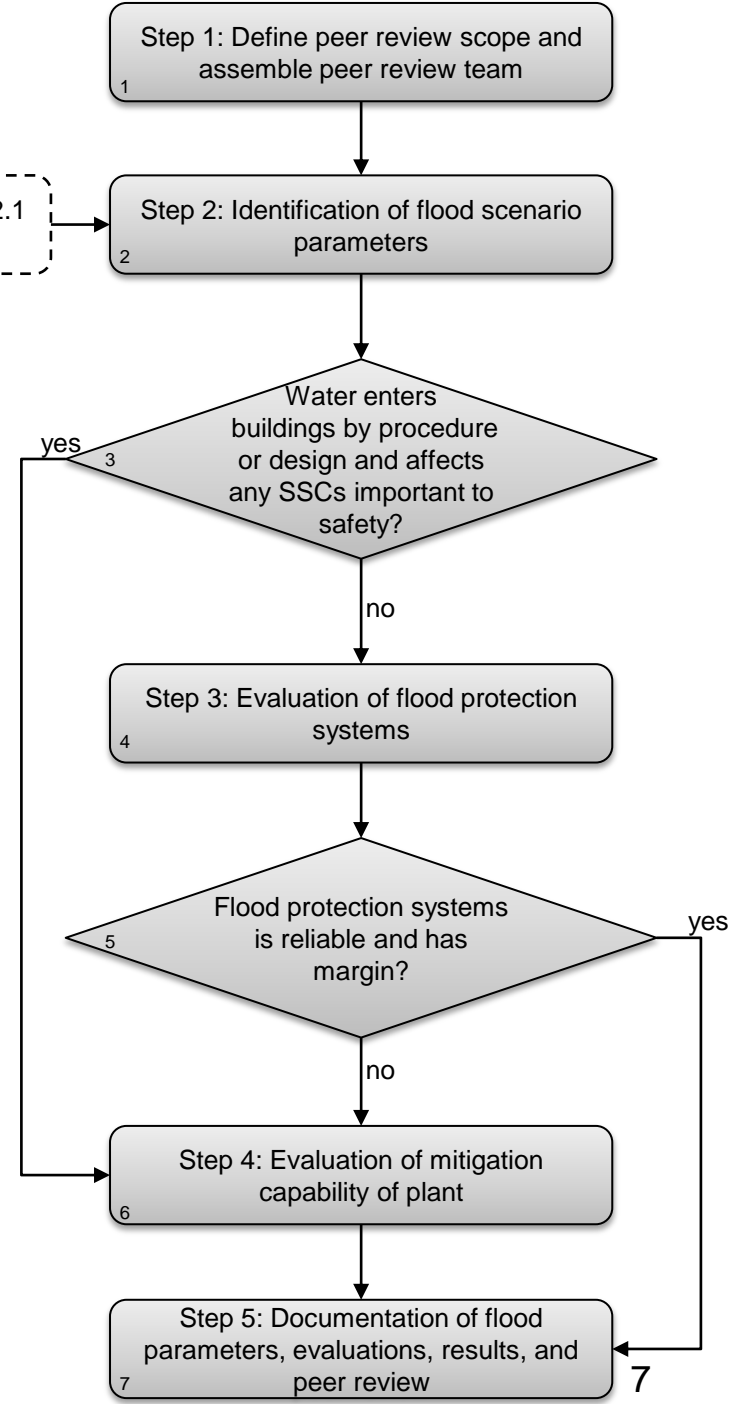
Graded approach in ISG



Key concepts in ISG

1. Use of all available resources for protection and mitigation
 - Evaluation accounts for the potentially reduced reliability of certain resources (e.g., temporary measures, non-safety related SSCs) relative to permanent, safety-related equipment
 - ISG recognizes that other parallel activities related to Fukushima lessons learned are ongoing
2. Flood frequencies
 - ISG does not require the computation of initiating event frequencies
 - Initiating event frequencies not used to screen out events
 - Use of the flood event frequency as part of a PRA
3. Human performance
 - Human performance may take on added importance during flooding events compared to normal operations

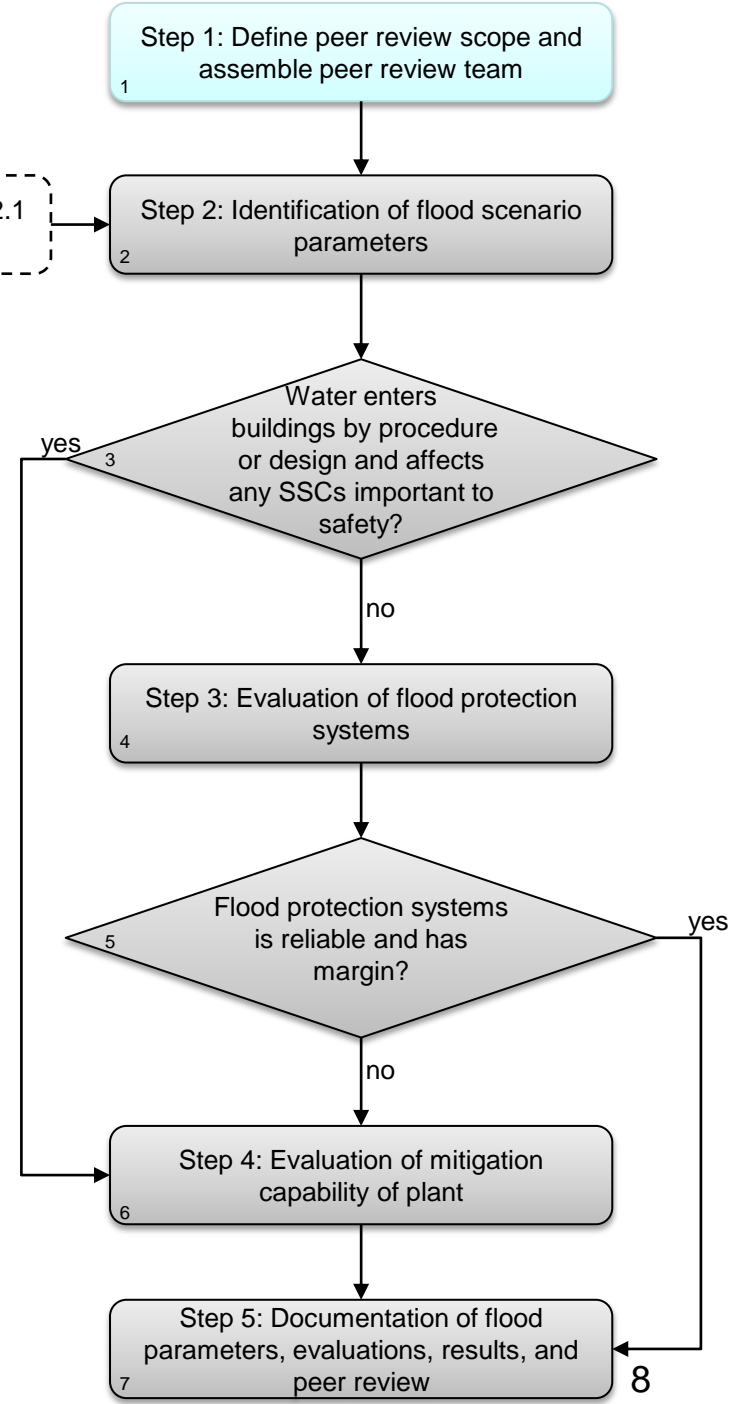
Results of NTF Recommendation 2.1
hazard reevaluations



Results of NTF Recommendation 2.1 hazard reevaluations

Peer review

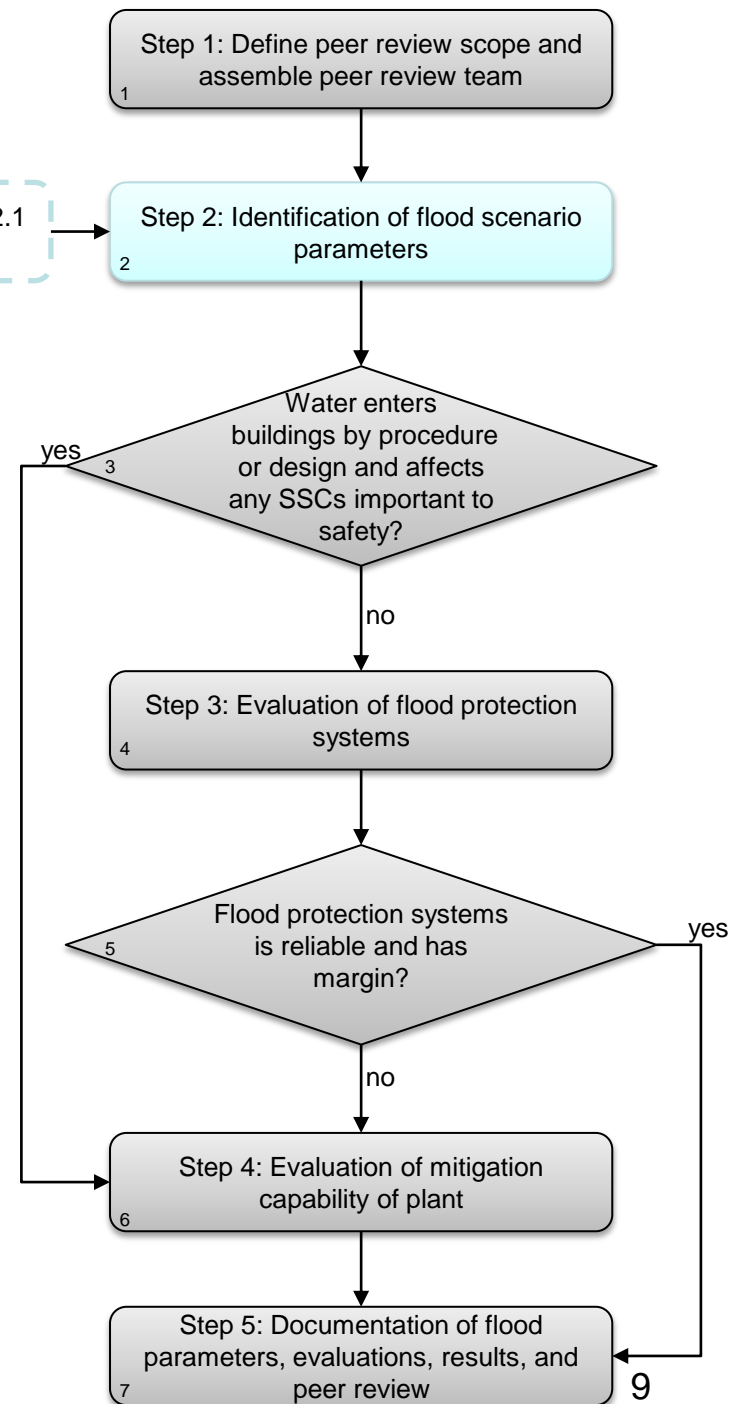
- An independent peer review is an important element of ensuring technical adequacy
- Integrated assessment uses a graded peer review



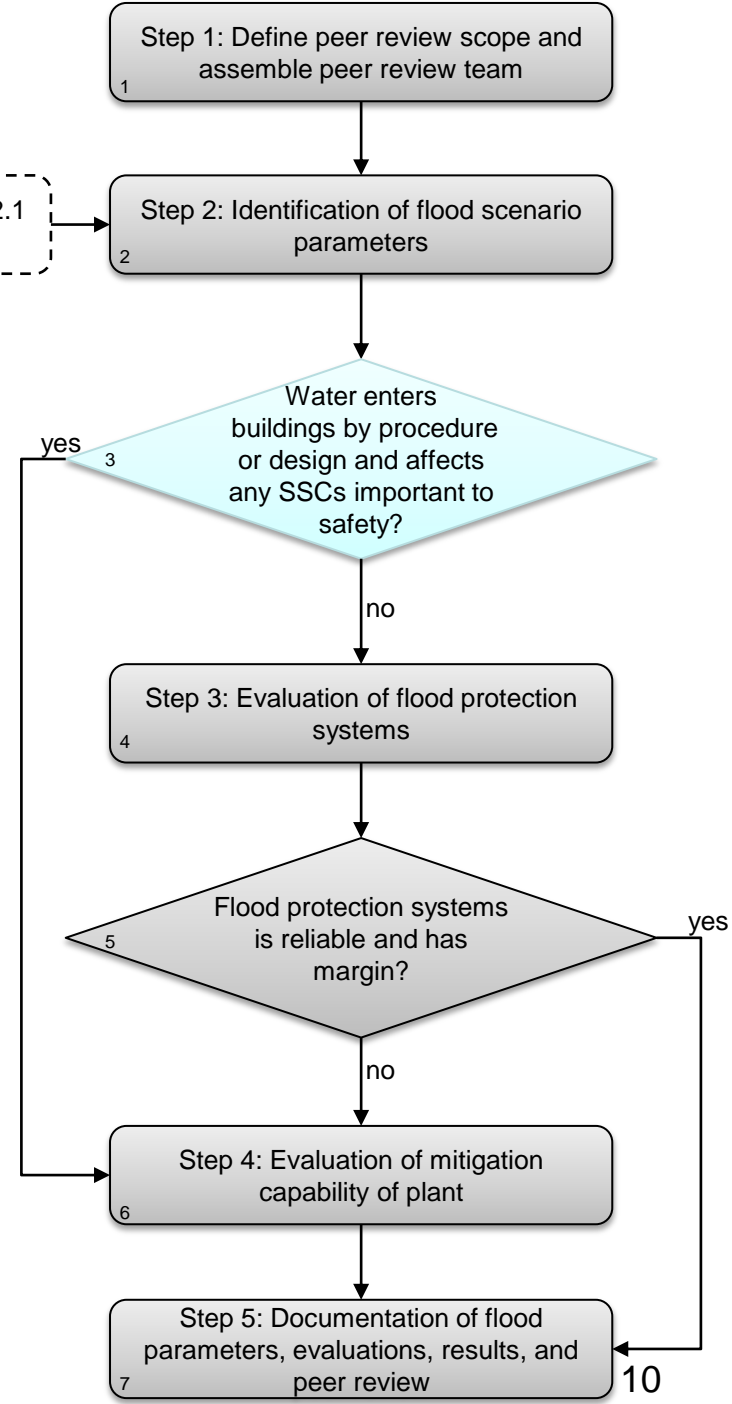
Results of NTTF Recommendation 2.1 hazard reevaluations

Flood scenario parameters

- Flood parameters based on the NTTF 2.1 hazard reevaluations
- Flood scenario parameters include:
 - flood height and associated effects
 - flood event duration and warning time
 - evolution of plant status during the flood event



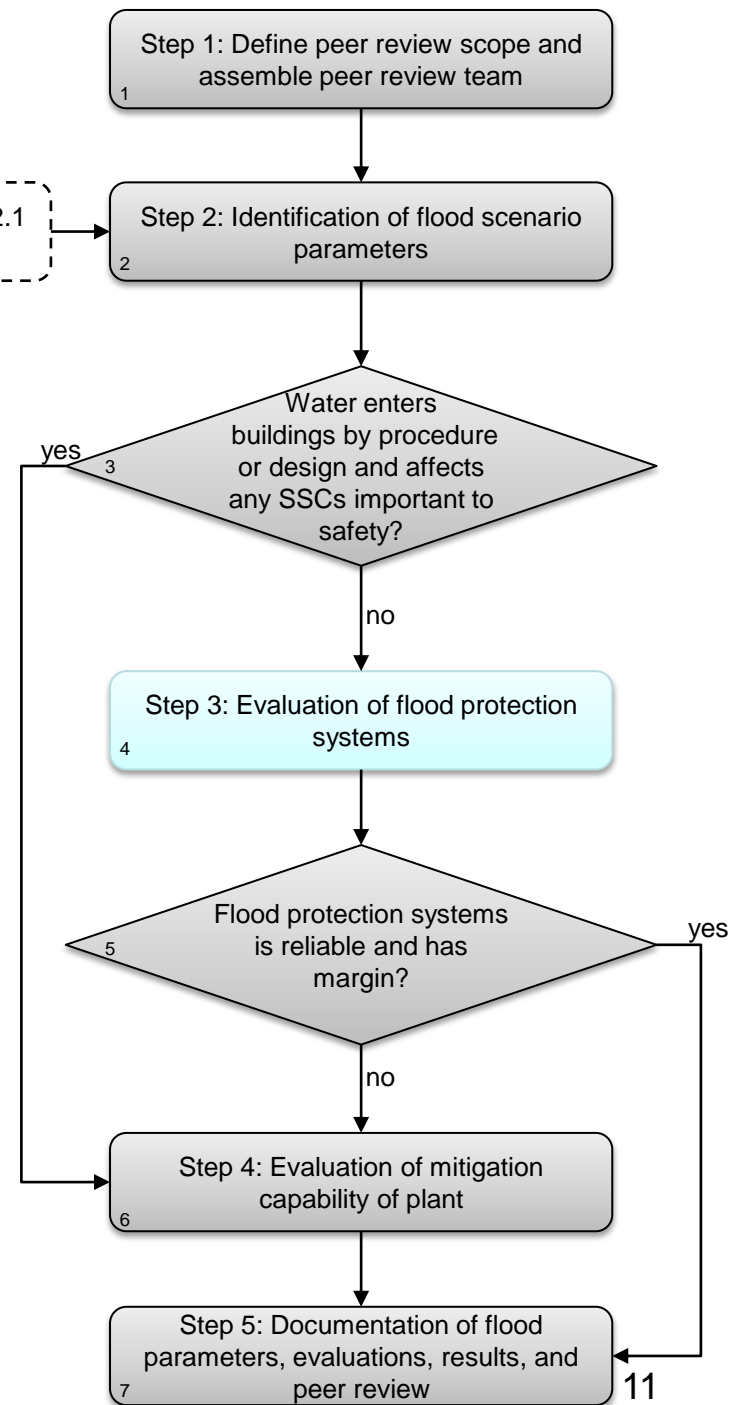
Results of NTF Recommendation 2.1
hazard reevaluations



Results of NTTF Recommendation 2.1 hazard reevaluations

Flood protection evaluation

- Capability of flood protection to protect SSCs important to safety
- Evaluated using qualitative and quantitative performance criteria
- Document available margin



Results of NTF Recommendation 2.1 hazard reevaluations

1 Step 1: Define peer review scope and assemble 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?

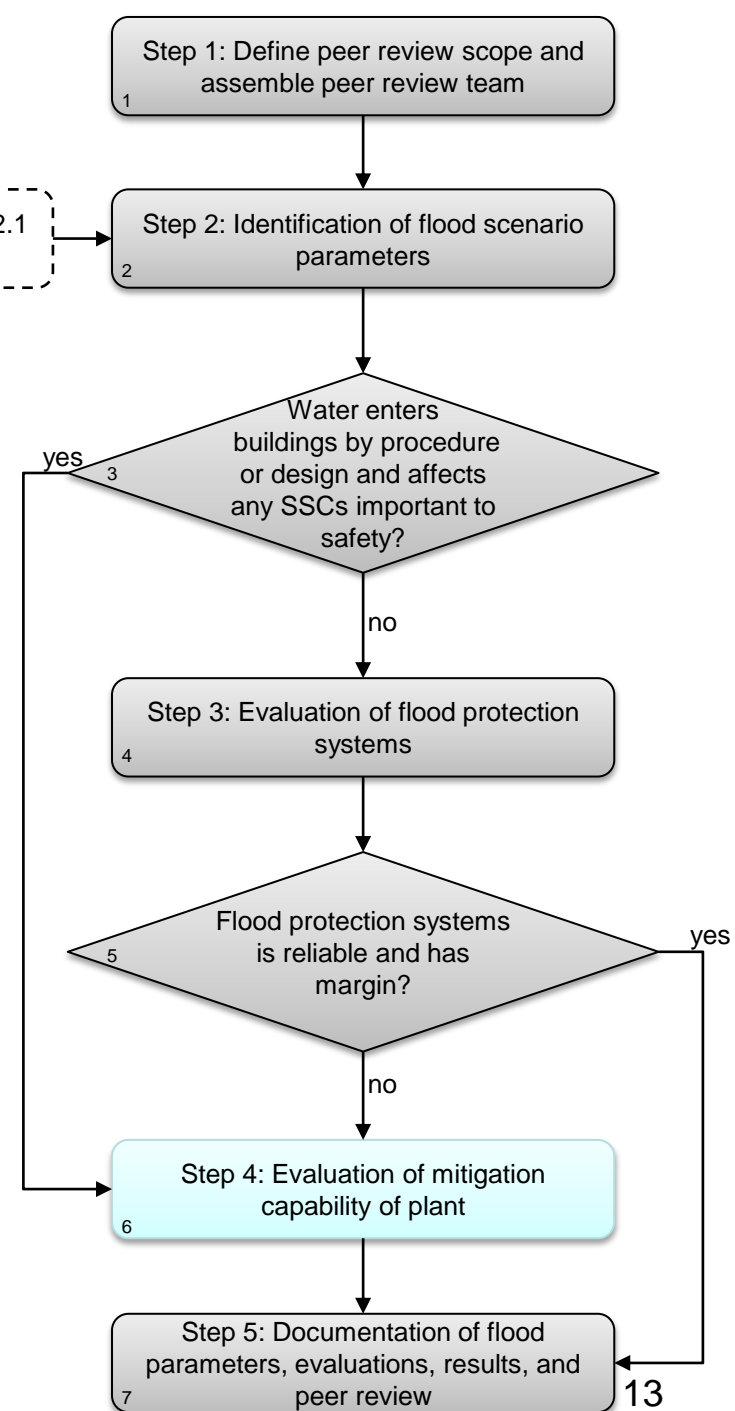
6 Step 4: Evaluation of mitigation capability of plant

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

Results of NTF Recommendation 2.1 hazard reevaluations

Mitigation capability

- 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 conditions
- Three evaluation options:
 - Scenario-based evaluation
 - Margins-type evaluation
 - Full PRA



Results of NTF Recommendation 2.1
hazard reevaluations

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Results of NTF Recommendation 2.1 hazard reevaluations

Appendices

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

