



**US Army Corps  
of Engineers®**

# ENGINEERING AND CONSTRUCTION BULLETIN

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**SUBJECT:** Transition Guidance for Levee System Evaluations for the National Flood Insurance Program (NFIP).

**CATEGORY:** Directive and Policy / Guidance.

## 1. References:

a. 44 CFR § 65.10: Title 44 - Emergency Management and Assistance; Chapter I - Federal Emergency Management Agency, Department of Homeland Security; Part 65 - Identification and Mapping of Special Hazard Areas; Section 65.10 - Mapping of areas protected by levee systems. (October 1, 2011 edition)

b. Engineer Regulation (ER) 500-1-1, Civil Emergency Management Program

c. Engineer Circular (EC) 1110-2-6067, USACE Process for the National Flood Insurance Program (NFIP) Levee System Evaluation (expired 31 August 2012)

d. Engineer Regulation (ER) 1140-1-211, Non-Department of Defense Reimbursable Services

e. Memorandum, HQ USACE (CECW-CE), subject: Draft Engineer Technical Letter 1110-2-570, "Certification of Levee Systems for the National Flood Insurance Program (NFIP)," 17 September 2007

f. Memorandum, HQ USACE (CECW-CE), subject: Implementation Guidance for Section 3014 of the Water Resources Reform and Development Act of 2014 (WRRDA 2014), Levee Certifications, 2 June 2017 and can be found at <https://www.usace.army.mil/Missions/Civil-Works/Project-Planning/Legislative-Links/wrrda2014/>

g. Memorandum, HQ USACE (CECW-P), subject: Revised Implementation Guidance for Section 1123 of the Water Resources Development Act (WRDA) of 2018, Certain Levee Improvements, 06 May 2019 and can be found at [https://www.usace.army.mil/Missions/Civil-Works/Project-Planning/Legislative-Links/wrda\\_2018/](https://www.usace.army.mil/Missions/Civil-Works/Project-Planning/Legislative-Links/wrda_2018/)

h. Memorandum of Understanding (MOU) Between the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE) for Alignment of Levee Activities, Information, and Messaging, 13 November 2014 and can be found at <https://www.usace.army.mil/Missions/Civil-Works/Levee-Safety-Program/Task-Force/>

i. Best Practices in Dam and Levee Risk Analysis  
<http://www.usbr.gov/ssle/damsafety/Risk/methodology.html>

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## 2. **Appendices.**

Appendix A. NFIP Accreditation Recommendation Validation Process Flow Chart

Appendix B. USACE Criteria for an NFIP Levee Accreditation Recommendation Using an SQRA or QRA

Appendix C. Funding of Risk Assessments for NFIP Levee Accreditation Purposes

3. **Purpose.** This Engineering and Construction Bulletin (ECB) directs that USACE cease using EC 1110-2-6067 (reference 1.c.) for all new levee evaluations for NFIP mapping purposes initiated after the date of issuance and begin using the process set forth in Appendix B of this ECB or successor guidance. As USACE and FEMA move to risk-informed levee evaluation processes, this ECB provides guidance explaining how to transition USACE Levee System Evaluation Reports (LSERs) from the process set forth in EC 1110-2-6067 to USACE accreditation recommendations using risk assessments as outlined in Appendix B.

## 4. **Background.**

a. In September of 2007, USACE issued interim guidance, reference 1.e., for its procedures related to evaluating a levee system for NFIP purposes, including the introduction of a 10-year validity period for USACE accreditation recommendations. The procedures in this interim guidance continued to evolve until eventually they were published as EC 1110-2-6067 in August of 2010, titled, “USACE Process for the National Flood Insurance Program (NFIP) Levee System Evaluation.” This EC established guidance for how NFIP Levee System Evaluations (LSEs) were conducted by USACE in order to be consistent with 44 Code of Federal Regulations (CFR) 65.10 (reference 1.a.). LSEs included technical findings which, for the floodplain in question, made a recommendation as to whether or not there was a reasonable assurance that the levee system would exclude the 1% annual exceedance probability (AEP) flood from the leveed area based on the condition of the levee system at the time the determination was made. EC 1110-2-6067 expired on 31 August 2012. This ECB directs that USACE cease using EC 1110-2-6067 for all new levee evaluations for NFIP mapping purposes initiated after the date of issuance of this ECB and begin using the process set forth in Appendix B or successor guidance.

b. Since the expiration of EC 1110-2-6067, USACE has been working in conjunction with FEMA to develop processes for sharing information with FEMA through its levee safety program activities, including the use of USACE Semi-Quantitative Risk Assessments (SQRAs) and Quantitative Risk Assessments (QRAs) for NFIP accreditation recommendations. This commitment to work together was documented in a Memorandum of Understanding (MOU) signed by USACE and FEMA on 13 November 2014, reference 1.h. The MOU states FEMA and USACE will establish a coordinated approach for levee activities that is aligned with the policies and goals of both agencies to promote life safety, flood risk reduction, risk communication, and sound national investments.

c. The Risk Management Center (RMC) is responsible for the development, dissemination, and training of risk assessment methodology used within the Levee Safety Program. Best

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Practices in Dam and Levee Risk Analysis (reference 1.i.) serves as the USACE basis for the overall philosophy, methods, and approach to risk assessments, including SQRA and QRA for levee systems.

d. This ECB provides guidance for the following possible scenarios:

(1) Scenario 1: Previous accreditation recommendations made by USACE that did not follow the guidelines of EC 1110-2-6067 and have not been rescinded as required by that Engineer Circular.

(2) Scenario 2: Previous Levee System Evaluation Reports (LSERs) developed in accordance with procedures in EC 1110-2-6067 and the LSER has not reached the end of its 10-year validity period.

(3) Scenario 3: Prior to the publication of this ECB, a new LSER has been initiated in accordance with EC 1110-2-6067 but has not yet been completed.

(4) Scenario 4: Assessments that include an NFIP accreditation recommendation by USACE that begins on or after the publication of this ECB.

**5. Applicability.** This ECB is applicable to all Headquarters USACE (HQUSACE) elements, Divisions, Districts, laboratories and field operating activities related to Civil Works projects.

**6. Directive.**

a. Scenario 1. If the current accreditation status in the NFIP is based on USACE supporting documentation that does not follow the procedures in EC 1110-2-6067, the USACE district must notify the levee sponsor(s) and FEMA that USACE can no longer remain on record as supporting that accreditation. If this notification has not yet been accomplished, the USACE district will do so in writing immediately.

b. Scenario 2. For levee systems with a USACE NFIP LSER that was developed and approved in accordance with procedures in EC 1110-2-6067; is currently still valid; and is being used as the documentation to support a current accredited levee recommendation for the NFIP, the USACE district Levee Safety Officer (LSO) will follow the guidelines in this section to decide whether the USACE accreditation recommendation remains valid. Reference Appendix A for a simplified flowchart. The evaluation to ensure the validity of the USACE recommendation should not be conducted until (1) at least 9 years have passed since the date the original LSER was signed and (2) unless there has been no other information up until that point that would indicate that the levee system NFIP accreditation can no longer be supported by USACE. The guidance in the following sub-paragraphs will be used by the district LSO to make this determination. District Inspection of Completed Works funding or project specific appropriations may be used to conduct this evaluation.

(1) Initial Requirements – Review of Most Recent Risk Assessment.

(a) If the most recent risk assessment for the levee system is a screening level risk assessment, review Levee Screening Tool (LST) results for all levee segments of the system, especially factors directly related to the NFIP. If the screening was accomplished prior to the LST version that included direct NFIP questions with findings, proceed to validating the secondary requirements in paragraph 6.b.(2).

(i) *Positive Findings.* If the screening was accomplished using the LST version that included direct NFIP questions with findings, all NFIP findings in the LST for all the associated levee segment screenings need to be Positive Findings (or N/A if appropriate) to justify a decision that the LSER remains valid and an extension is warranted. The LST NFIP findings are directly correlated with the main engineering requirements in 44 CFR 65.10 and there should be no conflicting information between a valid LSER (also based on 44 CFR 65.10) and the LST findings. If based on current information the district LSO determines the NFIP LST results should be Positive Findings but they are either marked as Negative Finding or Inconclusive, then the screenings should be updated as soon as practicable with the correct information and proper justification that aligns with validation of the secondary requirements in paragraph 6.b.(2). If the Positive Findings of the LST results are validated, proceed to validating the secondary requirements in paragraph 6.b.(2).

(ii) *Negative Findings.* If the findings of the LST results are not all positive or cannot be validated, proceed to documentation and notification in paragraph 6.b.(3)(a).

(b) If the most recent risk assessment for the levee system is an SQRA or QRA:

(i) If the SQRA or QRA NFIP recommendation is Do Not Accredite, then the accreditation recommendation determined in accordance with EC 1110-2-6067 is no longer valid. Proceed to documentation and notification in paragraph 6.b.(3)(a) if this notification has not already been conducted as part of finalizing the SQRA or QRA.

(ii) If the SQRA or QRA report has an NFIP recommendation that is Accredite, then the USACE district will validate that there is no new information that warrants changing the recommendation and provide FEMA with the finalized risk assessment report to replace the existing LSER to serve as the USACE documentation that the levee satisfies the requirements for NFIP accreditation. Once an SQRA or QRA has been conducted on a levee system, it will serve as the best available risk assessment for a particular levee system over a screening level risk assessment from that point forward. Any updates to the risk characterization, including the validation/update of the NFIP accreditation recommendation, will be accomplished by updating the SQRA or QRA.

(iii) If the SQRA or QRA report has a NFIP recommendation that is Inconclusive, the district LSO will consider the risk assessment results when considering the secondary requirements in paragraph 6.b.(2). There should be no information in the risk assessment in conflict with the justification for the levee system to remain accredited.

(2) Secondary Requirements.

(a) Height Evaluation.

(i) Determine whether there have been any flood events since the LSER was approved, and, if so, use that information to assess whether the Conditional Non-exceedance Probability (CNP) requirements in EC 1110-2-6067 are still met and the LST findings (e.g. freeboard and settlement) are still valid. This can be objectively evaluated by comparing the stage-frequency relationship(s) from flood event(s) to the curves used to justify the decision in the previous LSER.

(ii) Verify that there are no indications of settlement or other changed conditions that would impact the CNP.

(b) Performance Evaluation. Determine whether the current condition of the levee system would negatively affect how the levee would be expected to behave during a 1% AEP, with performance. If any of conditions below exist, the LSER should be considered invalid unless evidence and justification can be documented as to why the condition does not negatively affect the current accreditation recommendation. At a minimum, the following situations should be considered during the performance evaluation.

(i) Alterations have been made to the levee system that required an approval via the Section 408 process but the appropriate review and approval did not occur.

(ii) At least one levee inspection item associated with Seepage, Stability, Erosion, Foundations, or Closures for embankments or floodwalls has been rated Unacceptable since the LSER was approved and no corrections have been made.

(iii) Flood events since the LSER was approved resulted in signs or evidence of damage or distress of the levee system that would likely impact levee system performance during the next flood event and there are no near-term plans for repair.

(iv) Human intervention was required to successfully pass the flood event(s) that occurred since the LSER was approved. Assess whether that human intervention meets the requirements in paragraph B.4 of Appendix B.

(c) Operations and Maintenance Evaluation. When considering the continued validity of an accreditation recommendation, the operation and maintenance (O&M) criteria for NFIP accreditation should be validated. The levee system under evaluation will have an officially adopted O&M manual detailing specific actions and procedures. At a minimum, the manual will include information related to frequency of O&M activities. All O&M activities must be under the jurisdiction of a Federal or state agency, an agency created by Federal or state law, or an agency of a community participating in the NFIP to ensure all O&M requirements are met. In addition, review applicable inspection items from the most recent inspection to support validation of the O&M requirement.

(3) Documentation and Notification.

(a) If after the evaluation, the decision is the USACE LSER on record is no longer valid, the rationale for this decision will be documented in a Memorandum for Record as an addendum to the existing LSER and signed by the district LSO. A letter will be sent to FEMA and the levee sponsor(s), providing the Memorandum of Record and notifying them that USACE has completed an evaluation and the current USACE accreditation recommendation is no longer valid.

(b) If after the evaluation, the decision is the USACE LSER remains valid, the rationale for this decision will be documented in a Memorandum for Record as an addendum to the existing LSER and signed by the district LSO. The USACE LSER from that point must be reviewed every five (5) years in conjunction with a periodic inspection, until such a time the LSER can be replaced with a risk assessment report or conditions have changed that would result in the LSER report no longer being valid. A letter will be sent to FEMA and the levee sponsor(s), providing the Memorandum of Record with attached LSER notifying them that USACE has completed an evaluation to ensure that the accreditation recommendation is still valid. The letter shall make it clear that the current accreditation recommendation will be reassessed on a 5-year, reoccurring basis, but will become invalid at any time should conditions change or evidence arise to indicate the levee system no longer satisfies the NFIP accreditation requirements. In addition this notification should include a statement that the USACE methodology for NFIP accreditation will be changing to a risk-informed process using a risk assessment and is different than the methodology in the LSER.

c. Scenario 3. For levee systems in which engineering analysis is underway in accordance with EC 1110-2-6067 using an appropriate funding source, the USACE district may continue and develop the LSER in accordance with EC 1110-2-6067. The accreditation recommendation shall be validated every 5 years as described under Scenario 2.

d. Scenario 4. Assessments that include an NFIP accreditation recommendation that are initiated after the date of this ECB will follow the risk assessment process outlined in Appendix B of this ECB, including use of the appropriate funding source (see Appendix C), with one exception. For levee projects in active construction by USACE on the date of issuance of this ECB and with an existing expectation for USACE to provide an NFIP accreditation recommendation and documentation at the completion of the construction project, the district may choose to 1) develop an LSER, referencing the current design and construction documents as appropriate, in accordance with EC 1110-2-6067, that would then need to be validated every 5 years as described under Scenario 2 or 2) follow the risk assessment process outlined in Appendix B, which is the preferred option. Either choice will be funded from the project's construction funding.

e. As a reminder, USACE will follow its policies for providing NFIP accreditation recommendations and not the technical requirements of 44 CFR 65.10(b)(1) through (7). The provision for federal agencies in 44 CFR 65.10(e) allows for this. In addition, due to the direct partnership and commitment between USACE and FEMA related to collaborating on levee systems, there is flexibility in how USACE provides its documentation for an NFIP accreditation recommendation to FEMA and how FEMA accepts and reviews that documentation. USACE

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districts should not fill out FEMA application forms (e.g. MT-2 Form for Letter of Map Revision – LOMR) ) for mapping when USACE is providing documentation for an NFIP accreditation recommendation, as those forms do not reflect USACE requirements and procedures for a levee evaluation for NFIP purposes. Instead, USACE and FEMA should continue to coordinate in a collaborative manner and decide the best timing and mechanism for USACE to provide its NFIP related information while ensuring the involvement of the levee sponsor and community participating in the NFIP.

7. **Update.** All new requirements will be included in the next appropriate policy document update.

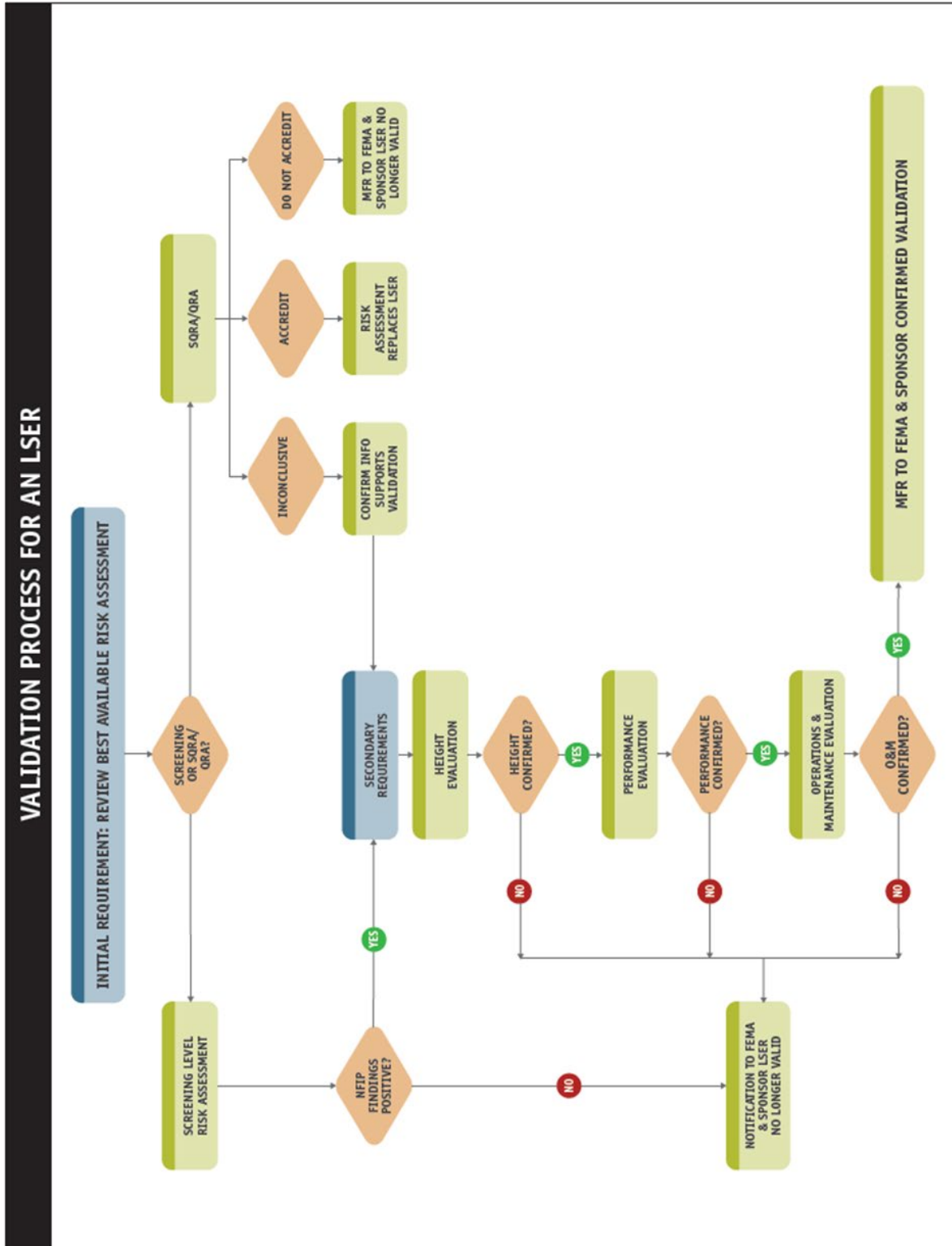
8. **Point of Contact.** The point of contact for this ECB is Richard J. Varuso, Ph.D., P.E. ([Richard.J.Varuso@usace.army.mil](mailto:Richard.J.Varuso@usace.army.mil)).

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APPENDIX A

NFIP Accreditation Recommendation Validation Process Flow Chart





## APPENDIX B

### USACE Criteria for an NFIP Levee Accreditation Recommendation Using an SQRA or QRA

B.1 Semi-Quantitative Risk Assessments (SQRAs) or Quantitative Risk Assessments (QRAs) will follow the process set forth by the Risk Management Center (RMC), including review by the Levee Senior Oversight Group (LSOG) and approval of the final risk characterization by the headquarters Levee Safety Officer (LSO).

B.2 Semi-Quantitative Risk Assessments (SQRAs). The following process will be followed to make a National Flood Insurance Program (NFIP) Levee Accreditation Recommendation using information from an SQRA.

a. The NFIP levee accreditation recommendation will be based on the annual exceedance probability associated with the total flood risk for the levee system. This requires combining the likelihoods for all prior to overtopping Potential Failure Modes (PFMs) with the likelihood of overtopping. In most cases, a summation of the likelihoods is sufficient for an SQRA. Consider the combined effect of all risk-driving potential failure modes and overtopping to estimate the total flood risk.

b. When the annual exceedance probability is at  $1E-2$  or more, the team should be confident in making a recommendation that the levee system should not be accredited for the NFIP. See Figure B.1.

c. When the annual exceedance probability is less frequent than  $1E-3$ , the team should be confident in making a recommendation that the levee system could be accredited in the NFIP. See Figure B.1.

d. When the annual exceedance probability is between  $1E-2$  and  $1E-3$ , the team's finding will likely be inconclusive based on the level of effort and degree of uncertainty of an SQRA. See Figure B.1. At this point, the team will have to discuss its confidence in this order of magnitude estimate, and whether it should remain inconclusive or whether the data and analysis have sufficient assurance that the team is willing to make a NFIP accreditation recommendation. There will have to be substantial evidence with high confidence and limited uncertainty to support a NFIP levee accreditation recommendation when the order of magnitude estimate is between  $1E-2$  and  $1E-3$ . The expectation is that most levee SQRAs will fall into this inconclusive category.

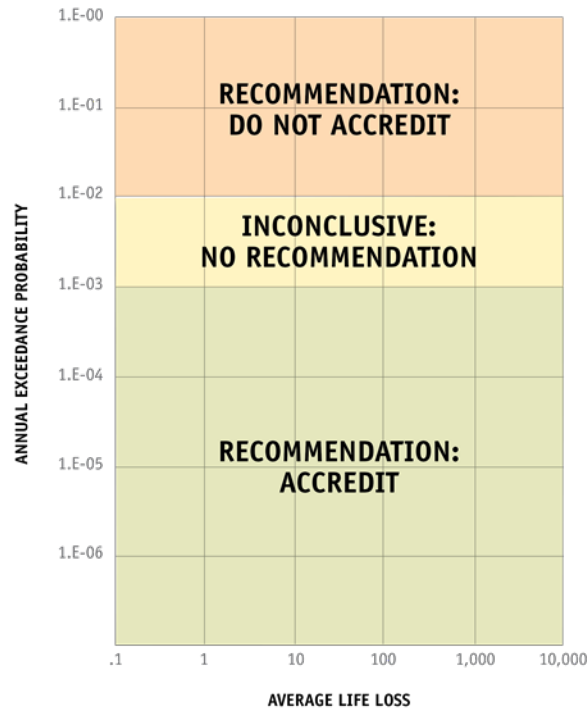


Figure B.1 - Guide for NFIP Levee Accreditation Recommendation from an SQRA

**B.3 Quantitative Risk Assessments (QRAs).** The following process will be followed to make an NFIP Levee Accreditation Recommendation using information from a QRA.

a. QRAs will include a computation of assurance of the 1% Annual Exceedance Probability (AEP). Assurance is an index of the likelihood that a specified target (in this case the 1% AEP) will not be exceeded. AEP represents the probability that flooding from levee breach or overtopping will occur in any given year considering the full range of possible annual floods. The 1% AEP for a levee refers to the probability that a levee has a 1% chance of overtopping or being breached in any given year. AEP can be further described as the annual probability that the leveed area will be inundated due to levee overtopping or breach. AEP may be computed with HEC-FDA or similar software that considers uncertainty in the hydrologic, hydraulic, and levee fragility inputs.

b. If the computed assurance for the 1% AEP is less than 65%, then the recommendation should be Do Not Accredite the levee system. There will have to be substantial evidence with high confidence and limited uncertainty to support a NFIP levee accreditation recommendation when the assurance is less than 65%.

c. If the computed assurance for the 1% AEP is greater than 85%, then the recommendation should be to Accredite the levee system. Only with very strong supporting evidence or notable uncertainty should a levee system with this level of assurance receive a recommendation that states: “Do Not Accredite.”

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d. If the computed assurance for the 1% AEP is between 65% and 85%, the accreditation recommendation must be based on evidence supporting the level of assurance, degree of uncertainty, past performance, and other factors that present a clear rationale for the recommendation.

B.4 Intervention Considerations. Intervention is defined as actions taken to detect a developing failure mode and actions taken to prevent breach due to that failure mode. If the NFIP recommendation is to Accredite and that recommendation is reliant on intervention, evidence and rationale specific to the intervention activities to support the recommendation must be presented to the LSOG and documented in the risk assessment report. Evidence and rationale should include information that demonstrate activities are well documented; there is sufficient detailed planning and coordination for implementation; there are adequate resources (personnel, material, and funding) for implementation; there has been successful past implementation of such activities; and there is reasonable time to implement such activities. The scale and scope of the intervention activities also will be scrutinized to consider the extent to which a potential failure mode would be reliant on intervention and how rapidly the failure mode could progress to breach without it. Unpredicted and unplanned emergency response activities are not acceptable intervention activities to be relied on to achieve an Accredite recommendation. In addition, advance measures, as defined in reference 1.b., will not be acceptable to justify a NFIP recommendation.

## APPENDIX C

### Funding of Risk Assessments for NFIP Levee Accreditation Purposes

C.1 For federally authorized, USACE operated and/or maintained levee systems, upon request by a community participating in the NFIP, a levee risk assessment, including an NFIP accreditation recommendation, may be funded through project appropriated funds, if available. Requests for funding to perform the evaluation will be made through the budget process for O&M activities.

C.2 For federally authorized, locally operated and maintained levee systems, upon request by a state, local, or tribal government, a levee risk assessment, including an NFIP accreditation recommendation, may be funded by the requester in accordance with reference 1.d.

C.3 For federally authorized levee systems operated and maintained by another federal agency, upon request by that federal agency, a levee risk assessment, including an NFIP accreditation recommendation, may be funded by the requesting federal agency (reference 1.d.).

C.4 Section 3014(b) of WRRDA 2014 (reference 1.f.) provides that, upon receipt of a request of a non-federal interest, the Secretary may accelerate carrying out a levee system evaluation of a federally authorized levee for purposes of the NFIP and that the evaluation shall comply with regulations for levee accreditation and be carried out in accordance with procedures established by the Secretary, in consultation with the Administrator of the Federal Emergency Management Agency (FEMA). It also provides that the funds made available under Section 22 of the WRDA 1974, as amended (42 U.S.C. 1962d-16), are available to carry out Section 3014(b) and that the cost sharing under Section 22 of WRDA 1974, as amended, applies to activities carried out under Section 3014(b). Follow the implementation guidance in reference 1.f. to cost-share a risk assessment for the purposes of the NFIP pursuant to this provision.

C.5. Section 1123 of the Water Resources Development Act of 2018 (WRDA 2018), provides the Secretary the authority, notwithstanding Section 211 of the Water Resources Development Act of 2000 (31 U.S.C. 6505 note), upon a written request of a local government, to provide technical services, on a reimbursable basis, to the local government to assess the reasons a federally constructed levee owned or operated by the local government is not accredited by FEMA. Additionally, Section 1123 provides that in cases in which a levee owned and operated by USACE is hydraulically tied to a federally constructed levee owned and operated by a local government, the Secretary is encouraged to cooperate, to the maximum extent practicable, with the relevant local governmental entities in assessing the reason the local levee is not accredited with FEMA. Follow the implementation guidance in reference 1.g. to provide technical services pursuant to this provision.