

USACE Levee Certification Policy and Risk Analysis

Questions have arisen as to the policy governing levee certification by USACE for the Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP), particularly as regards the application of risk analysis. Following paragraphs provide a bit of background, summarize existing policy, and give a glimpse into the way ahead.

Background:

1. In response to challenges to flood damage reduction project proposals and justification documents emanating from the Office of Management and Budget (OMB) and an array of local and special interests, USACE evolved its present risk analysis policy. The substance of the policy developed over a period of 3 to 4 years in the mid 1990s, culminated in publication of ER 1110-2-101, "Risk Analysis for Flood Damage Reduction Studies," in March 1996. The policy requires that a risk analysis (RA) framework be adopted for flood damage reduction studies and decisions, specifically noting requirements for RA for all critical engineering, economic, and environmental aspects. More specifically, RA is required for H&H, structural/geotechnical, cost, and benefits as reflected in flood damage reduction.

2. USACE recognized that its adopted risk analysis policy and methods had implications for floodplain management and associated NFIP levee certification, and immediately engaged FEMA leadership in such discussions. In April 1997, USACE and FEMA agreed on an approach to levee certification that embraced risk analysis, and published a policy letter to USACE field offices. The essential elements of the April 1997 risk analysis levee certification guidance are: (2a). Respect the elements and principles of 44 CFR 65.10 (i.e., demonstrate a degree of assurance of containing the base flood); (2b). Replace the fixed, minimum freeboard criteria components of the certification with a quantified assurance (Conditional Non-exceedance Probability – referred to as 'assurance') as follows: [Use 44 CFR 65.10 minimums provided that they achieve at least 90-percent assurance of containing the base flood](#) (may require higher, stronger levees); [but protection need not be greater than providing 95 -percent assurance of containing the base flood \(may certify for lower-height levees than 44 CFR 65.10 minimums\)](#); and (2c) to the extent possible, quantify and include in the analysis, uncertainty in the performance of the geotechnical and structural features of the levee system. The risk analysis levee certification policy has been in place since the policy letter was issued in April 1997. The intent in the April 1997 levee certification policy letter was to apply risk analysis as reflected in ER 1110-2-101 to levee certification to ensure consistency in USACE policy for flood damage reduction-related decisions. Note that prior to the April 1997 certification letter, USACE had not issued guidance to the field other than forwarding a copy of 44 CFR 65.10 when it was originally published in 1986.

Existing Policy:

1. ER 1110-2-101 was updated and reissued in January 2006, reaffirming the USACE commitment to risk analysis in its flood damage reduction mission while also updating risk terminology to contemporary terms, clarifying a few minor points, and updating the examples and displays.

2. A guidance letter was issued in June 2006 specifically addressing the FEMA Map Mod program and USACE levee certification policy; essentially reaffirming the April 1997 letter as continuing to be applicable. Attached to the June 2006 letter was an update of the decision chart attachment to the April 1997 levee certification policy letter. The update reflected deleting the 'grandfathering' branch (that permitted non-risk analysis) on the decision chart as no longer appropriate, changing the terminology to contemporary terms, and introduced the term 'assurance' as an alternative to 'conditional non-exceedance probability' – a term not easily stated nor understood. While these letters did not specifically address the 'waivers' (from risk analysis) that were granted to levee systems that were in active study/development status in 1997, consistent with FEMA's memo 34 to revisit/insure a currently active certification determining is on file, logic suggests that the old 'waivers' are no longer valid. Thus, all levees studied by USACE for certification will apply risk analysis as noted in the guidance.

3. It needs to be noted that at the time of the issuance of the June 2006 letter, the understanding of its authors was that the intent of the 1997 letter and its update – apply risk analysis as reflected in ER 1110-2-101 – continued to prevail. As it turns out, another letter had been issued in 1997 by HQUSACE Chief of Engineering Division that exempted geotechnical analysis from the levee certification letter requirements just issued, thus essentially limiting the certification analysis to only H&H. By inference, other engineering factors evaluation for certification was expected to apply traditional contemporary deterministic methods. As it stands at the moment, it does appear that in the absence of newly issued guidance, risk analysis required for levee certification is limited to H&H matters.

4. A companion letter to the June 2006 Map Mod/Levee certification letter issued in August 2006 clarified the authorities for USACE performance of levee certifications and provided funding guidance.

The Way Ahead:

1. Commencing in mid-November, an ETL is under development that will provide technical guidance for USACE levee certifications. It will document policy, study process and outreach, coordination, technical criteria and guidance for complete engineering evaluation, and ITR and staffing/signature requirements. The applicability of risk analysis for the various engineering components will be addressed. A multi-disciplinary USACE engineering team will prepare the document over the coming six to seven months.

2. It is anticipated that in the relatively near-term, the exemption from risk analysis for levee certification for geotechnical evaluations will be rescinded, thus restoring consistency between the risk analysis policy of ER 1110-2-101 and USACE levee certification policy. Levee certification will then require risk analysis that encompasses all essential engineering and O&M aspects of all components of levee systems (embankments, floodwalls, pumps, closure structures, interior drainage, etc.). The methods and policies emerging from the on-going dam and levee safety initiatives and programs, which by the way are framed in a risk analysis context, are expected to provide the impetus for rescinding the waiver and extending the policy for levee certification to full risk analysis. To the extent that timing and circumstances permit, the ETL being developed will incorporate the status/guidance for performing risk analysis for levee certification for all engineering elements.

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