DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

10 APR 1997

REPLY TO
ATTENTION OF:

CECW-P/CECW-E

MEMORANDUM FOR ALL MAJOR SUBORDINATE COMMANDS

SUBJECT: Guidance on Levee Certification for the National Flood Insurance Program

1. Use of risk-based analysis by the U.S. Army Corps of Engineers in flood damage reduction project formulation studies has created a disconnect between the Corps analysis and the Federal Emergency Management Agency's (FEMA) levee certification policy. FEMA's policy requires that levees be structurally sound, properly maintained, and have at least three feet of freeboard above the 100-year flood profile elevations before FEMA will recognize that the levees provide protection. The Corps risk-based analysis eliminates the concept of arbitrary freeboard by incorporating risk and uncertainty throughout the formulation process.

2. To ensure that levee certification to FEMA is performed by the Corps in a consistent manner, the enclosed guidance has been developed for use by all Major Subordinate Commands (MSC). This guidance has been reviewed and accepted by FEMA, and establishes Corps-wide standard procedures applicable to all future levee certification decisions.

3. It is recognized that levee certification commitments based on existing FEMA regulations have been made to non-Federal sponsors for some projects in progress. Exceptions to the new guidance will be considered for uncertified projects for which levee certification commitments already have been made. Each MSC should submit a list of projects that fall into this category, along with a justification for the exception, to CECW-EH by NLT 30 April 1997.

4. Points of contact for this guidance are Mr. Earl Eiker, telephone (202) 761-8500, or Mr. Ken Zwickl, telephone (202) 761-1855.

FOR THE COMMANDER:

Encl

RUSSELL L. FUHRMAN
Major General USA
Director of Civil Works

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CECW-P/CECW-E 25 March 1997

GUIDANCE ON LEVEE CERTIFICATION FOR THE NATIONAL FLOOD INSURANCE PROGRAM

1. **PURPOSE AND APPLICABILITY:** This document provides guidance to be used for certifying levees to the Federal Emergency Management Agency (FEMA) for their administration of the National Flood Insurance Program (NFIP). This guidance does not affect plan formulation and evaluation procedures. It is intended to provide a consistent methodology for levee certification by the Corps of Engineers. This guidance applies to all Corps District and Division offices. Note that levee certifications are provided to FEMA at the District/Division option and within available funds.

2. **BACKGROUND:** By letter dated 21 March 1996, FEMA requested that the Corps review its criteria for levee certification in order to ensure consistency in administration of the NFIP by FEMA. This concern has arisen as a result of the Corps application of Risk-Based Analysis (RBA) in flood damage reduction project formulation studies. FEMA's policy requires that levees be structurally sound, properly maintained, and have at least 3 feet of freeboard above the 100-year flood profile elevations before FEMA will recognize that the levees provide protection from the 100-year flood. The FEMA requirements are fully explained in 44 CFR, Chapter 1, Part 65.10 of the Code of Federal Regulations. The FEMA requirements include data and analysis submission requirements for design criteria (freeboard, closures, embankment protection, embankment and foundation stability, settlement, interior drainage), operations plans and maintenance plans. 44 CFR Part 65.10 also states that in lieu of the structural requirements and data and analysis requirements, a Federal agency with responsibility for levee design may certify that a levee has been adequately designed and constructed to provide 100-year protection.

Levee certification for NFIP purposes can best be explained as follows. FEMA may request a "levee certification" from the Corps by letter directly to the Corps District office. The letter normally contains language such as:

> "...Please provide this office with current certification as to whether the design and maintenance of this levee are adequate to credit it with 100-year flood protection. Please note that such a statement does not constitute a warranty of performance, but rather the Corps current position of the levee system's design adequacy..."

3. **POLICY:** The Corps will continue to work with FEMA to ensure that Risk-Based Analysis provides improved information for levee certification decisions. The following guidance and decision tree should be used until further notice.

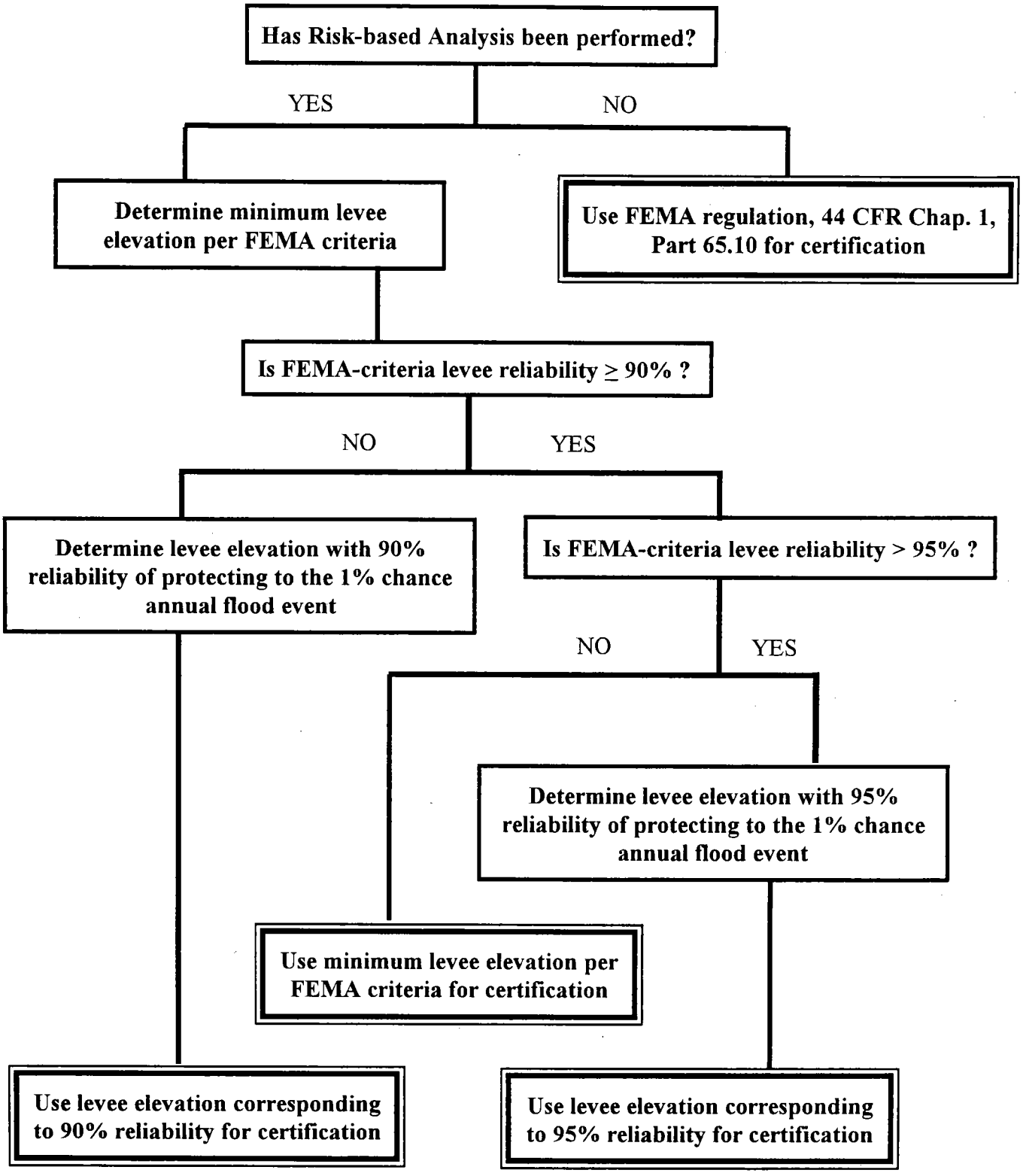
GUIDANCE ON LEVEE CERTIFICATION FOR THE NATIONAL FLOOD INSURANCE PROGRAM

a. **Existing Levees, No Risk-Based Analysis Available:** For certification purposes, the Corps should evaluate the levees based primarily on FEMA criteria contained in 44 CFR Chapter 1, Part 65.10. Thus, the general rule will be that if a levee will contain the median one percent chance flood, with three feet of freeboard, it should be certified as being capable of passing the FEMA base flood, as long as it is adequate based on a geotechnical and structural evaluation, as described below. Exceptions to the three feet of freeboard requirement may be pursued, based on the FEMA policy of permitting other Federal agencies responsible for levee construction to certify that levees will pass the FEMA base flood. Such exceptions should be based on careful evaluation of the hydrologic, hydraulic, structural and geotechnical uncertainties, and current levee condition as discussed below.

b. **Existing and Proposed Levees, Risk Based Analysis Available:** In these cases, output on project performance from the Risk-Based Analysis should be used to arrive at a decision regarding levee certification for FEMA. Existing and proposed levees will be certified as capable of passing the FEMA base flood if the levees meet the FEMA criteria of 100-year flood elevation plus three feet of freeboard, with two exceptions, as follows. When the FEMA criteria results in a "Conditional Percent Chance Non-exceedance" (Reliability) of less than 90%, the minimum levee elevation for certification will be that elevation corresponding to a 90% chance of non-exceedance. When the FEMA criteria results in a reliability of greater than 95%, the levee may be certified at the elevation corresponding to a 95% chance of non-exceedance. For existing levees, the certification decision is also contingent upon a structural and geotechnical evaluation, as described below. For proposed levees, the geotechnical and structural issues are assumed to be accounted for during design and construction of the levees.

c. **Engineering Evaluation:** A geotechnical and structural evaluation will be used to determine the water elevation at which the levee is not likely to fail. In some cases, this water level will be the determining factor in the decision to certify the levee system. The procedures to be used in the evaluation of a levee system for NFIP levee certification should consist of an engineering evaluation to determine if the levee system meets the Corps design, construction, operation and maintenance standards, regardless of levee ownership or responsibility. The District will examine available existing information and data, such as original design, surveys of levee top profile, levee cross-sections, records of modifications and changes, performance during past flood events, and remedial measures. It will also include a field inspection of the levee, structures, closure devices and pumping stations to evaluate the adequacy of maintenance. The engineering analysis should examine the project with respect to embankment stability, underseepage, through seepage, and erosion protection. Existence of closure devices will necessitate a review of the adequacy of flood warning time for the complete operation of all closure structures.

LEVEE CERTIFICATION DECISION TREE



FEMA Criteria = 1% chance median annual flood event plus three feet of freeboard
RELIABILITY = % chance non-exceedance given the 1% chance annual event occurs