ASFPM FEMA/USACE Levee Discussion

The USACE & FEMA Meet the Nation’s Levee Challenges

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Today’s Agenda

1. The levee challenge & our objectives for this discussion
2. Session Format – How will this interactive session work?
3. Major Areas to be covered
   ➤ Joint USACE/FEMA efforts
   ➤ FEMA activities
   ➤ USACE activities
4. Your other levee issues
This Levee Session’s Objective

- **KNOWLEDGE** - Provide you with insight into:
  - USACE’s and FEMA’s joint efforts

- **PARTICIPATION** - Provide a forum that encourages you to ask questions and provide feedback.
The Continuing Levee Challenge

- The nation has thousands of miles of levees.
- Over 1/4 of the counties in the US have levees.
- ASCE gave a report card grade of “D-” to levees.
- Levees are aging and more stuff is being put behind them.
- Citizens living behind levees assume they are safe from flooding.
Format for Today’s Discussion

- **Step #1** – Facilitator provides a “question/comment”
- **Step #2** – FEMA & USACE panelists provide a response
- **Step #3** – Audience comments/expands on question/response
- **Step #4** – Panelists may provide additional responses
- **Intermittent Step #5** – Facilitator requests feedback from the audience
Question #1 – High level Overview

What is FEMA’s levee role & responsibilities?

What is the USACE’s levee role & responsibilities?
Risk MAP (Mapping, Assessment, Planning)

Through collaboration with State, Local, and Tribal entities, Risk MAP will deliver quality data that increases public awareness and leads to action that reduces risk to life and property.
FEMA’s Role in Levees

- Present flood hazard and risk information
- Establish appropriate risk zone determinations
- Establish mapping standards
- Accredit levee systems on FIRMs
- Produce outreach and communication materials
- Explain risk of living with levees
USACE Levee Safety Program
Mission

...ensure levee systems provide benefit to the Nation by working with stakeholders to assess, communicate, and manage the risks to people, the economy, and the environment...
Goals for the Levee Safety Program

- Develop increased understanding of benefits and risks of levee systems
- Promote actions to manage risks
- Make transparent and credible decisions
- Make wise federal investment decisions
Question #2

How have you been cooperating since last year’s discussions?
USACE-FEMA MOU (11/13/2014)

- **Purpose** – Formalize the commitment for alignment of levee activities, information, and messaging
- **Content** – Coordination of policies, direct exchange of information for accreditation, consistent information sharing with sponsors and communities, and coordination for data management

USACE-FEMA MOU

- Continue coordination as policies and activities evolve
- Both agree to use the National Levee Database as the central repository of levee information
- USACE will ensure that each time it conducts a risk assessment for a levee system, it will also provide a determination on levee performance to FEMA for NFIP mapping purposes
- FEMA will accept a risk assessment from USACE as fulfilling the design criteria requirements in 44 CFR 65.10
- USACE will identify when a levee system meets or does not meet a specified subset of requirements in 44 CFR 65.10 for inspections and screenings
- FEMA will accept a USACE screening or inspection showing that a subset of requirements in 44 CFR 65.10 are met
Inventory of Levee Status
National Levee Database

- 2,500 levee systems
- 14,700 miles
- Other agency levees
  - BOR = 172 miles
  - Miami Conservancy District = 2.6 miles

FEMA data is merged and under review
FEMA MLI/NLD Integration

- Differences between MLI and NLD require changes to the NLD to capture all MLI information.
- Will be done as part of an overall NLD improvement process.
- FEMA and USACE have established a data management working group.
- Ongoing discussions about data storage needs. Data includes those developed from USACE activities as well as from FEMA accreditation submittals.
- FEMA is committed to using the NLD.
Question #3

So what are your agencies working on in addition to the NLD?

And how are you letting us know?
FEMA – USACE Coordination

Why should FEMA and USACE work together to communicate risk?

• Complementary Goals for both agencies
• Provide timely and best available information to inform public and reduce risks to life and property
Risk = f(Hazard, Performance, Consequences)

What are the hazards and how likely are they to occur?

How will the infrastructure perform in the face of these hazards?

Who and what are in harms way? How susceptible to harm are they? How much harm is caused?

USACE Levee Safety Program: Focused on People, Risks, and Actions
Recognizes Uncertainties
Beyond Building Bigger, Safer Levees

FLOOD RISK MANAGEMENT: BUYING DOWN RISK

Initial Flood Risk

Risk Reduction Tools (Cumulative)

- Buy outs and relocations
- Zoning & Building Codes
- Outreach & Education
- Response & Evacuation Plans
- Flood Insurance
- Levees, Reservoirs, etc

Residual Flood Risk

All stakeholders contribute to reducing risk!
Implementation: New USACE Risk Communication Guidance

- USACE Guidance for engaging sponsors and FEMA in Levee Safety Program activities (includes communicating risks associated with levees):
  - Placing information in a risk context
  - Focusing on risk factors and risk reduction actions

- Objectives:
  - Improve public sponsor engagement in and knowledge of USACE levee safety activities
  - Develop increased understanding of benefits and risks of levee systems
  - Promote actions to manage risks
  - Build foundation for shared responsibilities of solutions
Opportunity for increased visibility on what each agency is doing with respect to levees

Improve coordinated messages between the agencies

Improve relationships

Link specific inspection and screening items and risk assessments to NFIP

More joint participation with levee sponsors and communities

Leverage ongoing activities – Silver Jackets and RiskMAP

Share best practices and lessons learned
FEMA – USACE Coordination

- **Opportunities:**
  - Numerous levee systems across the USA
  - Ensuring information is current
  - Focus on risk communication and risk reduction:
    - USACE’s primary relationship is with levee sponsor
    - FEMA’s primary relationship is with community
- Coordination of activities between the two agencies:
  - 10 FEMA Regions
  - 8 USACE Divisions
  - 41 USACE Districts
  - Thousands of communities and sponsors
FEMA Regions vs. USACE Districts
Question #4

Your Cooperation and communication is appreciated, what is its impact on:

- our certification/accreditation efforts?
- Will risk based analysis have an impact?
<table>
<thead>
<tr>
<th>NFIP REQUIREMENTS (44 CFR 65.10)</th>
<th>CAN COMPLIANCE BE DETERMINED THROUGH:</th>
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<tbody>
<tr>
<td><strong>CFR CRITERIA CATEGORY</strong></td>
<td><strong>CFR CRITERIA SUBCATEGORY</strong></td>
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<td>Design Criteria</td>
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<td>Freeboard (levee height)</td>
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<td>Closure devices for all openings</td>
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<td>Embankment protection</td>
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<td>Embankment and foundation stability</td>
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<td>Interior drainage</td>
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<td>Operation Plans</td>
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<td>Closures</td>
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<td>Interior Drainage Systems</td>
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<td>Maintenance Plan</td>
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Why a USACE Levee Inspection Alone ≠ Accreditation for the NFIP

- Visual Inspection
- No engineering analyses, including hydraulic modeling performed
- Focus on condition to top of levee regardless of design level (100 year or 1% is used for the NFIP)
- Inspection information informs the NFIP
Why a USACE Levee Risk Screening Alone ≠ Accreditation for the NFIP

- Screenings look at performance from a levee safety perspective – not just the 1%
- Screenings are a screening level assessment based on best available information
- Level of rigor of analysis will not allow for an accreditation decision for all NFIP criteria
What USACE levee activity can result in an NFIP accreditation decision?

Risk Assessments
Questions to be answered by a Levee Safety Risk Assessment

- What are the most likely failure modes?
- What are the primary risk drivers?
- What is the current estimated risk?
- What Risk Reduction Measures are appropriate?
- Is further investigation needed?
- New question added: Should the levee be accredited by FEMA?
Benefits to the Risk Assessment Approach

- Analysis based on a range of flood events
- Being able to prioritize actions and determine sense of urgency of implementing actions
- Identification of potential consequences for different scenarios
- Understanding of areas of uncertainties and confidence in decisions
- Supports risk management decisions – levee sponsor, community, and individual residents
Audience Feedback #1

- Any questions concerning the coordination that the two agencies are taking?
  - Any recommendations for improving coordination and outreach?
  - What will help you meet your challenges?

- Does this interagency cooperation meet your expectations; any concerns?
Question #5

On

Any Updates

LAMP or Other Levee Mapping Activities?
FEMA’s Levee Analysis and Mapping Approach

- For Non-Accredited Levee Systems

- Approach Document
  - Finalized July 2013

- Operating Guidance
  - Finalized September 2013
Non-Accredited Levees

- New process allows a non-accredited levee system to be analyzed as multiple “Reaches”
- A “Reach” is a discrete section of a levee for which one of the five levee analysis procedures can be applied
  - Sound Reach
  - Freeboard Deficient
  - Overtopping
- Primarily data dependent:
  - O&M Plan available?
  - As-Builts/Levee Survey?
  - Evaluation of overtopping erosion?
  - Structurally sound?
  - Closures/Tie-Ins?
  - Structural Based Inundation
  - Natural Valley
Future: Mapping Flood Risk

- Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12)
- Homeowners Flood Insurance Affordability Act (HFIAA) of 2014
- Water Resources Reform and Development Act (WRRDA) of 2014
- National Research Council (NRC) – National Academy of Sciences (NAS)
- American Society of Civil Engineers (ASCE) 2014 Report on National Flood Risk Management
- Association of State Floodplain Managers (ASFPM), National Association of Flood & Stormwater Management (NAFSMA), etc.
- Technical Mapping Advisory Council (TMAC)
National Flood Mapping Program
42 U.S.C. §4101b (Section 216 of BW12)

(b) Mapping
(1) In general

In carrying out the program established under subsection (a), the Administrator shall—

(A) identify, review, update, maintain, and publish National Flood Insurance Program rate maps with respect to—

(i) all populated areas and areas of possible population growth located within the 100-year floodplain;

(ii) all populated areas and areas of possible population growth located within the 500-year floodplain;

(iii) areas of residual risk, including areas that are protected by levees, dams, and other flood control structures;

(iv) areas that could be inundated as a result of the failure of a levee, dam, or other flood control structure;

(v) areas that are protected by non-structural flood mitigation features; and

(vi) the level of protection provided by flood control structures and by non-structural flood mitigation features;

(B) establish or update flood-risk zone data in all such areas, and make estimates with respect to the rates of probable flood caused loss for the various flood risk zones for each such area.
Audience Feedback #2

- How many of you involved in:
  - FEMA certification - accreditation?
  - LAMP efforts?
- Any reaction to - Mapping of residual risk areas?
- Any recommendations?
Question #6 – for USACE

Levee areas of interest

Any updates on other levee activities?
Levee Safety Program Guidance

- Organizational and programmatic policy
  - Roles and responsibilities
- Applying the risk framework
- Risk Assessments
  - Inspections
  - Methodology
  - Risk characterization
- Risk Management
  - Risk management actions
  - Portfolio risk management
- Risk Communication
Design and Construction of Levees

► Consider regional design approaches
► Consider performance expectations including operations, maintenance, flood-fighting efforts and associated documentation
► Use risk-based potential failure modes to establish design objectives and approaches
Example Case Histories
Good Coverage for Entire Country

WHERE WE ARE – U.S. ARMY CORPS OF ENGINEERS

Other Organizations
- Engineer Research and Development Center (ERDC)
- Engineering and Support Center, Huntsville
- Army Geospatial Center
- USACE Finance Center
- USACE Expeditionary
- Marine Design Center
- Institute for Water Resources
- 24th Engineer Battalion

LEGEND
- Division HQ Location
- District HQ Location
- District and Division Co-located
- Division Boundary
- District Boundary
- State Boundary

Pacific Ocean Division
Northwestern Division
South Pacific Division
Southwestern Division
Transatlantic Division

Great Lakes & Ohio River Division
North Atlantic Division
Hawaiian Division

Middle East District
Afghanistan Engineer Districts
North
Soviet

Japan
Korea

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Alterations to Levees

- 33 USC 408
- Provides the Secretary of the Army authority to grant permission to alter a USACE civil works project if

  1. *Does not impair usefulness of the project*
  2. *Not injurious to the public interest*
408- Policy Purpose

- Improve consistency in the way USACE considers, processes, and documents decisions for requests for alterations to Civil Works projects.
- Create a process that is applicable to all types of Civil Works projects.
- Be transparent on what information is required.
- Create a process that can be tailored by districts to the appropriate scope, scale, and complexity of a proposed alteration.
Key Points

- Process is intended to be scalable, based on the scope and scale of the proposed alteration
- Process is district led
- Created some ways to streamline the process
- Coordination throughout the process is encouraged
Levee Alterations

- System Performance Analysis
- EO 11988
- Consideration risk assessment information
- Those with life safety concerns will be require higher level review
New Legislation - WRRDA

- Broader than levees
Purpose

- Ensure lives and property behind levees are safe
- Encourage use of appropriate engineering practices
- Support public education and awareness projects
- Improve security of levees in the US
- Encourage state levee safety program
Key Components

- Committee on Levee Safety – assess initiative effectiveness
- 1 time Levee Inventory/Review – using USACE risk assessment processes
- Levee Safety Initiative –
  - Levee Safety Guidelines
  - Hazard Potential Classification System
  - Technical Assistance and Materials
  - Public Education and Awareness
  - State/Tribal Levee Safety Programs (FEMA)
  - Levee Rehabilitation Assistance Program
- Recommendations for
  - National Dam and Levee Safety Program
  - Alignment of Federal Programs Related to Levees
  - Liability for Certain Levee Engineering Projects
Last Opportunity – Final Audience Feedback

- What is the best way for us to help you stay engaged?
- Are you interested in eventually participating in the national levee safety program?
- Any other issues/concerns or questions you would raise?
Not the End
WE ALL STILL HAVE WORK TO DO!
Risk-Informed Design Progression

- **Annualized Probability of Failure**
- **Life Loss**

** Existing Conditions**
- Low Population Levee
- Minimum Berm
- Minimum Berm + Flood Fighting

** Higher Standard Berm**
- High Population Levee
- Minimum Berm
- Higher Standard Berm
- Higher Standard Berm + Flood Fighting
- Higher Standard Berm + Flood Fighting + Improved Emergency Evacuation

** TRRL**

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*[Graph and legend not transcribed]*
Failure Modes & Event Trees

Intervention

- Early
- Detection of Need for Intervention
  - Yes
  - No
- Late

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9A
- Intervention is Unsuccessful
  - Yes
  - No

9B
- Heroic Intervention is Unsuccessful
  - Yes
  - No

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Levee Breaches

Breach

Yes

No