

Overview of the Corps of Engineers PL-84-99 Program, Levee Safety Act, and the Corps Perspective on Levee Certification



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PL 84-99 Rehabilitation and Inspection Program

- **Hank DeHaan**
- **Rock Island District**
- **February 16, 2010**



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Continuing Eligibility Inspections

- 110 Levee Systems in Rock Island Dist. Program
 - ▶ Federal Projects: 82
 - ▶ Non-Federal Projects: 28



2010 Annual Routine Inspections

- Inspection Status:
 - ▶ Field Inspections
 - 75% Complete
 - Fully complete by May 2010
 - ▶ Inspection Reports
 - 20% Complete
 - Fully complete by June 2010



Flood Damage Reduction System Status

- Acceptable
 - ▶ What does it mean?

- Minimally Acceptable
 - ▶ What does it mean?



Flood Damage Reduction System Status

- Unacceptable
 - ▶ What does it mean?
 - ▶ How will this rating affect the sponsor?



Factors Affecting Rating Process



- Increasing Flood Damages
- Congress and USACE Focused on Reducing Risk
- Clearer Levee Inspection Guidance
- Implementation of Levee Safety Program and Periodic Inspections



Future of Inspection Program

- Improved Tools
 - ▶ Levee Inspection Tool
 - ▶ National Levee Database
- Clarifying Inspection Guidance
- Improved Communication



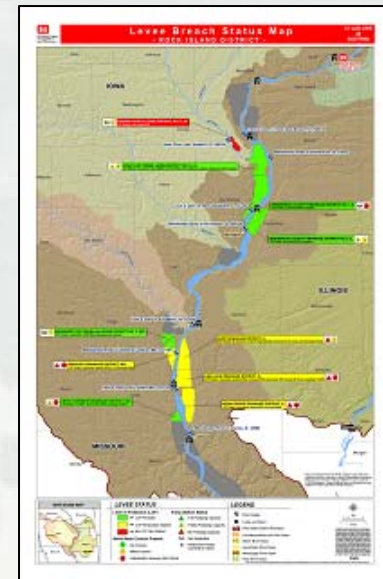
Levee Rehabilitation Status

- 2008 Flood Repairs - Rock Island District
 - ▶ 27 Levee System Repairs (of 110)
 - 18 Federal / 9 Non-Federal
 - ▶ Levee System Repairs by State
 - Iowa: 13
 - Illinois: 8
 - Missouri: 6
 - ▶ To date, \$60 million expended on repair efforts
 - ▶ Estimate \$80 million expended when fully complete
 - Iowa: \$16M, Illinois: \$51M, Missouri: \$13M



Levee Rehabilitation Status

- Levee System Repair Status – Rock Island District
 - ▶ Breaches
 - All breaches repaired except Louisa County Levee District No. 11
 - ▷ High water, ice and life safety issues led to work stoppage in fall
 - ▶ Pump Station
 - Three repair efforts remain
 - ▷ Two Rivers – 28 Feb
 - ▷ Hunt – 20 Mar
 - ▷ Union Township – 9 Apr
 - ▶ Wave-Wash & Other
 - 11 levee system repairs remain
 - Dredging work completed
 - Work primarily involves shaping of levees
 - Will be completed in spring/summer 2010



Levee Safety Program

Alan H. Tamm
Rock Island District
February 16, 2010



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Levee Safety Act – Levee Safety Program Overview

- Background
- Team
- Key Activities
- Roles and Responsibilities
- American Recovery and Reinvestment Act (ARRA)



Levee Inspections

Inspection Check List

- Automated Levee Inspection System (LIS)
 - ▶ Aids collection of data
 - ▶ Uniformity of inspection
 - Quality and reproducibility
- Improve Risk Communications with Local Sponsors and Public



Levee Safety Program Mission



Assess the integrity and viability of levees and recommend actions to assure that levee systems do not present unacceptable risk to the public, property and the environment

Program Objectives:

- Hold Public Safety Paramount
- Reduce Economic Impacts
- Maximize cost effectiveness
- Develop Reliable And Accurate Information
- Build Public Trust and Acceptance



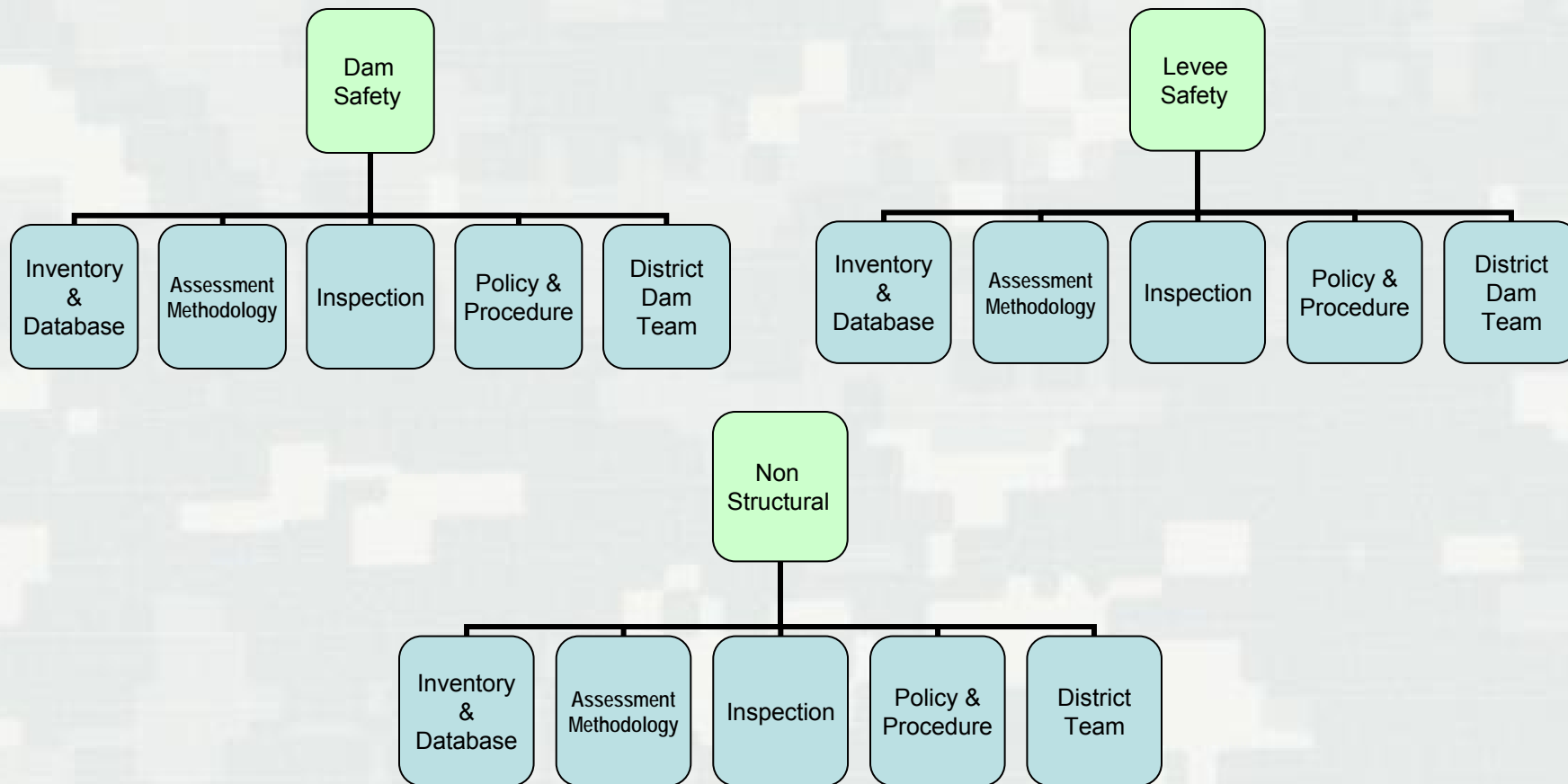
Levee Safety Program

Levee Safety Program Formally Created in 2006

- Assess Integrity and Viability of Levee Systems
- Recommend Improvements
- Create National Levee Database (NLD)
- Develop Methodology for Risk Assessment
- Review and Revise Policies and Procedures



3 components of USACE Flood Risk Management



Levee Safety Program

- Public Safety is our Top Priority
- Levees Do Not Eliminate Flood Risk
- It is a shared Responsibility
- The “1% event” is not a Safety Standard
- It’s No Longer Business as Usual
- Transparent - Informed Decisions



Levee Safety Program Key Activities

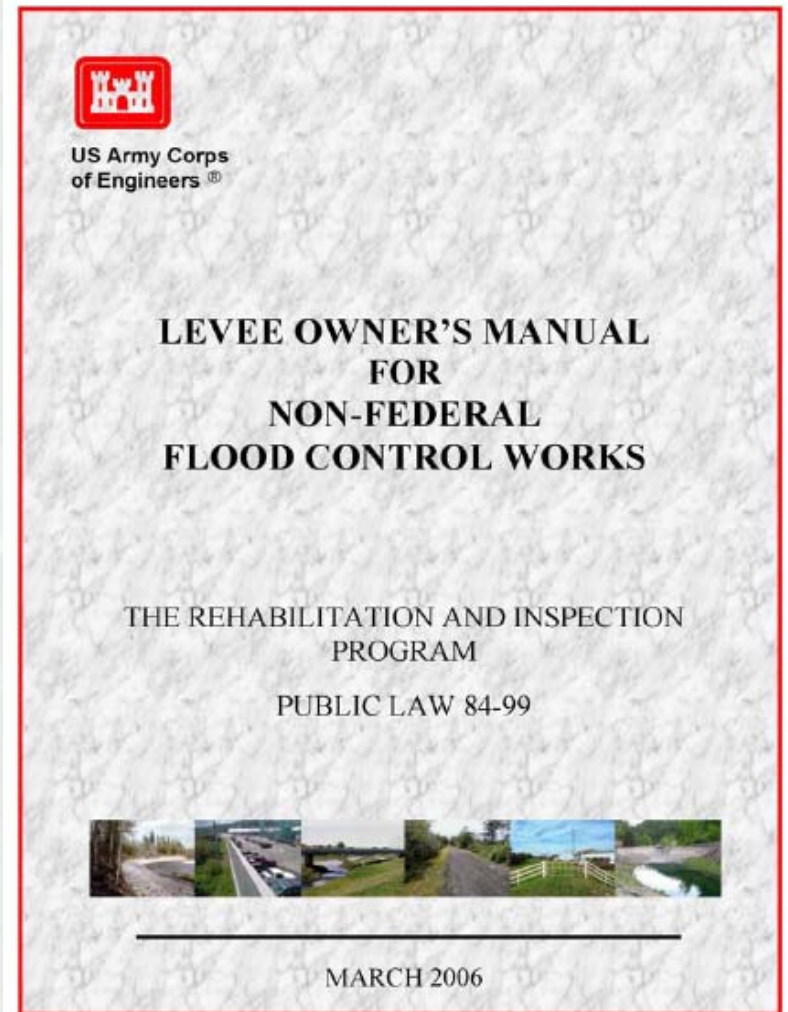
Tiered approach

- Routine Inspections (**Annually**)
 - ▶ Verify Proper Operation and Maintenance
- Periodic Inspections (**Every 5 Years**)
 - ▶ Verify Proper Operation and Maintenance
 - ▶ Evaluate Operational Adequacy and Structural Stability
 - ▶ Identify components and features to monitor over time
- Risk Screening (**Initiated 2009**)
- Periodic Assessment (Future?)



Levee Owner's Manual

- Procedures for USACE and Sponsor – good basic information
- Check List *Is Not* Current
 - ▶ Evolution of performance based knowledge
- Valuable References Listed
- To be re-issued with updated information (2010?)



Levee Safety Program

Levee Information Managed with Technology

National Levee Database (NLD)

- Developed by USACE and FEMA
- Repository for Levee Data
- Geospatially Enabled Database
- Uniform Database Structure
- Benefits:
 - ▶ Consistency
 - ▶ Expedited access to information



Levee Data Model Features



Checklists –

What is expected to be Inspected

- Historically more detailed due to experience modification
- Information is used to assess risk

Figure 13: Risk Equation Definitions

$$\text{Risk} = \text{Probability} \times \text{Consequence}$$

(1) Loading Event Probability
(2) Potential Failure Mode
Probability of Failure
Release Severity Probability

(3) Loss of Life
Economic Damage
Other Consequences

From : 2009 National Commission on Levee Safety Report



Levee Risk Screening Tool

- Outcomes
 - ▶ Identification of relative risk
 - ▶ Eventually assist in classifying levees
 - ▶ Guide setting priorities
 - ▶ Identify performance concerns and potential consequences of levee failure
 - ▶ Identify issues to assist in prioritizing interim risk reduction measures



Levee Safety Program assisted through ARRA

Ten Tasks Performed by AE

1. Project Plan
2. Standardized Workshop
3. Data Collection
4. Design Criteria Review
5. Pre-Inspection Packet
6. Field Inspection
7. Draft PI Report
8. Independent Technical Review
9. Conduct PI Out-Brief
10. Closeout PI



Order of PI Performance

Address	City	Population of City - Year 2000 Census
Ward 1 - ZIP 42801	Ward 1 - ZIP 42801	113
Ward 2 - ZIP 42802	Ward 2 - ZIP 42802	113
Ward 3 - ZIP 42803	Ward 3 - ZIP 42803	113
Ward 4 - ZIP 42804	Ward 4 - ZIP 42804	113
Ward 5 - ZIP 42805	Ward 5 - ZIP 42805	113
Ward 6 - ZIP 42806	Ward 6 - ZIP 42806	113
Ward 7 - ZIP 42807	Ward 7 - ZIP 42807	113
Ward 8 - ZIP 42808	Ward 8 - ZIP 42808	113
Ward 9 - ZIP 42809	Ward 9 - ZIP 42809	113
Ward 10 - ZIP 42810	Ward 10 - ZIP 42810	113
Ward 11 - ZIP 42811	Ward 11 - ZIP 42811	113
Ward 12 - ZIP 42812	Ward 12 - ZIP 42812	113
Ward 13 - ZIP 42813	Ward 13 - ZIP 42813	113
Ward 14 - ZIP 42814	Ward 14 - ZIP 42814	113
Ward 15 - ZIP 42815	Ward 15 - ZIP 42815	113
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Ward 98 - ZIP 42898	Ward 98 - ZIP 42898	113
Ward 99 - ZIP 42899	Ward 99 - ZIP 42899	113
Ward 100 - ZIP 42900	Ward 100 - ZIP 42900	113

- Based on Population At Risk
 - ▶ Determined by HAZUS
 - ▶ 2000 census
 - ▶ Best Available Data



Past Routine Inspection Results



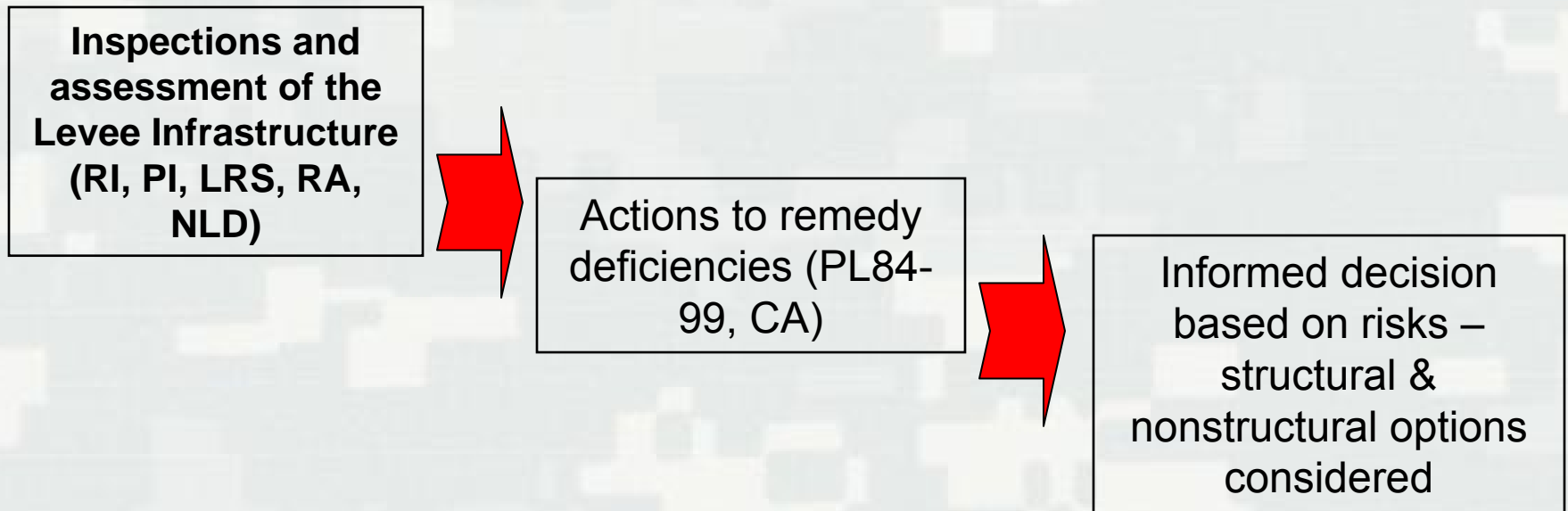
Dissemination of Results

- Information flow will occur through the established Corps Guidance
 - ▶ Sponsors will be informed of deficiencies ASAP
- Levee Systems - Executive Summary to be posted on the USACE Website
 - ▶ Summary is not FOUO information.
- Actions after inspection:
 - ▶ Consider full range of risk management options
 - ▶ Evaluate actions through holistic Cost and Benefits
 - ▶ Implement those that are cost effective



LEVEE Safety Program Summary

- #1 Program Purpose: Safety of citizens that rely on Levee physical infrastructure



USACE Perspectives on Levee Certification

Jerry Skalak

Rock Island District

February 16, 2010



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Levee Evaluation, Certification, and Accreditation

- **Terminology**
- **Historical perspective**
- **FEMA notes**
- **Corps notes**
- **An accredited levee...**



- ***Inspection***
 - ▶ Routine (annual) and periodic
 - ▶ Accomplished to protect P.L. 84-99 interest
 - ▶ Not specific to level of protection
- ***Evaluation***
 - ▶ Comprehensive and rigorous assessment
 - ▶ Can be the basis for completing certification
- ***Certification***
 - ▶ Must be accomplished by either a registered professional engineer or a Federal agency with levee design and construction qualifications
 - ▶ FEMA submittal and review process
- ***Accreditation***
 - ▶ Inclusion of a certified levee on a FEMA flood insurance rate map
 - ▶ Affects flood insurance requirements and rates and floodplain regulations



History

- Map Modernization Program and Digital Flood Insurance Rate Maps (DFIRMs)
- Levee certification requirement
 - ▶ Procedure Memorandum 34 (issued in 2005)
- Provisionally Accredited Levee (PAL) agreement
 - ▶ 2 yrs to complete certification
 - ▶ 1 yr interim status report requirement
 - ▶ Timeframe between PAL agreement expiration and any de-accreditation varies



FEMA notes

- FEMA does not do nor does it fund levee certifications.
- FEMA accredits levees on its maps that have been certified by others.
- An accredited levee is one that FEMA recognizes on its Flood Insurance Rate Map (FIRM) as providing protection from the 1% or greater annual chance flood event
- FEMA doesn't decertify levees. FEMA de-accredits (i.e. removes) levees from its maps that are not certified.
- For more information go to FEMA web site at:
http://www.fema.gov/plan/prevent/fhm/lv_state.shtm



Corps notes

- Corps is not funded to certify levees other than those it owns, operates, and maintains
- Corps is funded to make available upon request any pertinent data it holds in support of levee evaluations/certifications by others (e.g. private sector A&E firms)
- Corps may perform certifications (evaluations) at the request of the non-Federal sponsor on a reimbursable basis (per Jan 23, 08 HQUSACE guidance)
- For more information see the National Flood Risk Management Program web site:

<http://www.iwr.usace.army.mil/nfrmp/>



Corps Levee Certification

- Corps requirements are consistent with FEMA's 44 CFR 65.10
 - ▶ Corps guidance includes updated methods and references to current Corps practices and requirements
- Corps will not issue a partial certification
 - ▶ System approach
- Corps certification has a maximum period of validity of 10 yrs
 - ▶ Review may be required based on changed conditions
- Corps certification requires risk & uncertainty analysis
 - ▶ Statistical methodology for determining freeboard requirements
- Emergency operation and flood warning plan required for Corps certification



Why do you want to have an accredited levee?

- Mandatory flood insurance requirements do not apply; however lower cost, preferred risk policies are available - insurance is still highly recommended!
- Protected area is considered to be outside the 1% chance event (i.e. 100 yr) regulatory floodplain.
- Greater awareness of residual risk.
 - ▶ **Area designated on map as protected by levee**



Questions?

