Presentation
to the

CIVIL WORKS REVIEW BOARD

WOOD RIVER LEVEE SYSTEM RECONSTRUCTION PROJECT

by
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Deputy Commander, St. Louis District
Mississippi Valley Division

25 October 2005

Presentation Overview

Study Authority and Background
Existing Project
Problems and Objectives
Alternatives Considered
Design Deficiency / Recommended Plan
Reconstruction / Recommended Plan
Cost
ITR, Agency, Public, and HQ Comments
Systems and Watershed Context
Environmental Operating Principles
Sponsor's Support
MSC Briefing
Policy Review Assessment
Lessons Learned

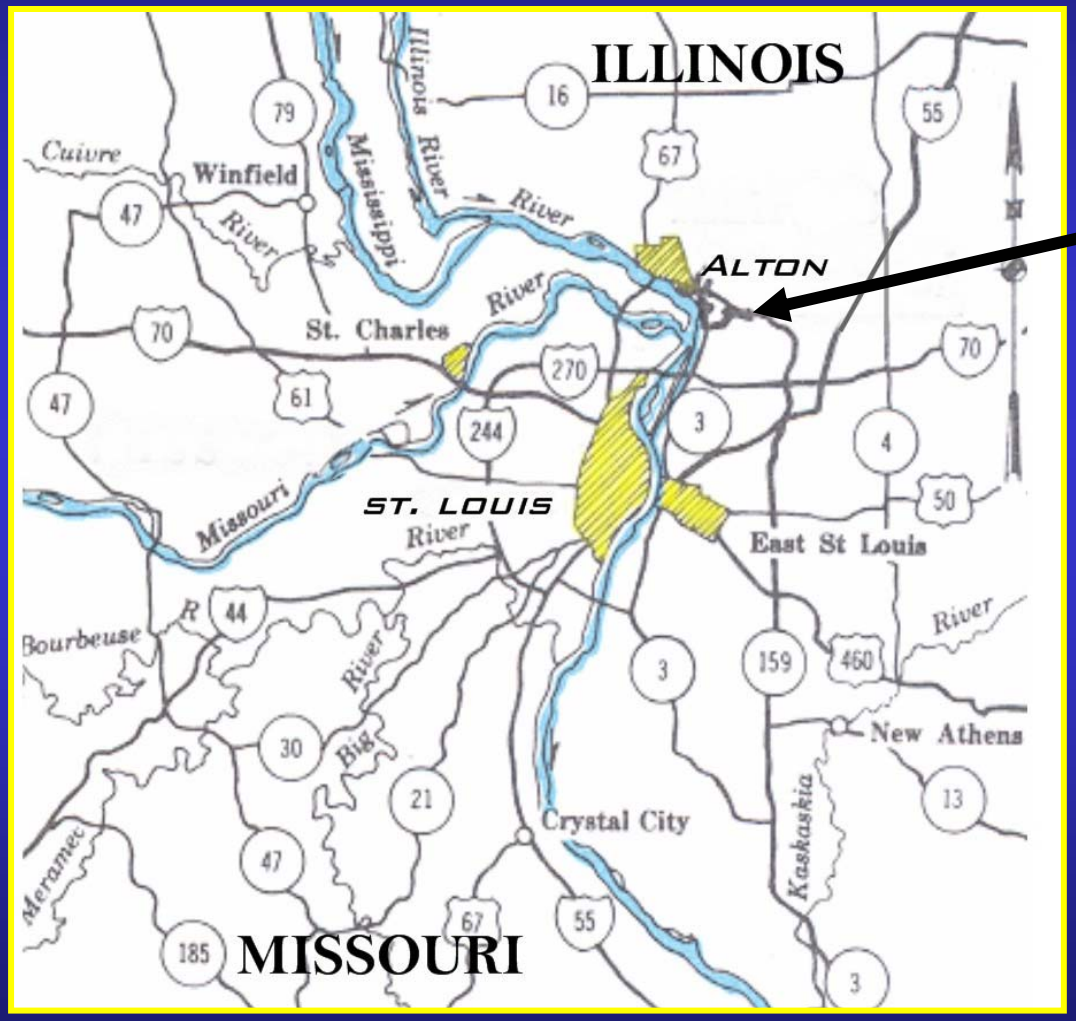
Study Authority

Resolution of the Committee on Transportation and Infrastructure, U.S. House of Representatives, May 7, 1997:

" ...the Secretary of the Army is requested to review the report of the Chief of Engineers on the Mississippi River between Coon Rapids Dam, Minnesota, and the mouth of the Ohio River,... to determine whether modifications of the recommendations contained therein are advisable at this time, for the purpose of reconstructing the facilities of the Wood River Drainage and Levee District along the Mississippi River in Madison County, to return the levee and pump stations and other appurtenant features to their original degree of protection."

Original Project Authorization – Flood Control Act of 28 June 1938, to provide flood protection to urban, agricultural and industrial areas.

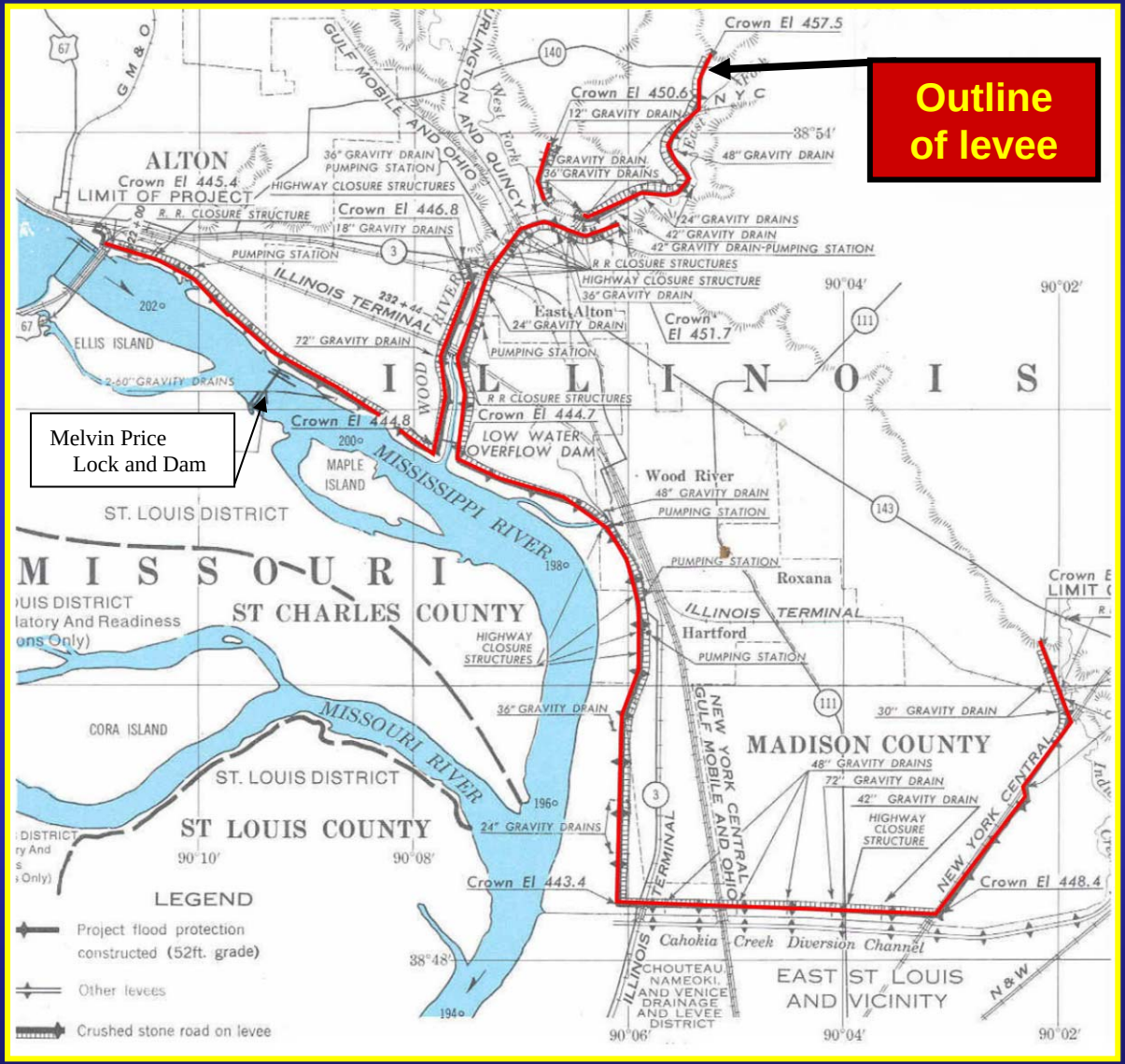
Wood River Levee System



PROJECT LEVEES

The non-Federal sponsor is Wood River Drainage and Levee District

Study Area


Outline of levee
Melvin Price Lock and Dam
ALTON
Crown El 445.4
LIMIT OF PROJECT
Crown El 446.8
Crown El 457.5
Crown El 450.6
Crown El 451.7
Crown El 444.8
Crown El 444.7
Crown El 443.4
Crown El 448.4
ILLINOIS TERMINAL
GULF MOBILE AND OHIO
NEW YORK CENTRAL
WOOD RIVER
MISSISSIPPI RIVER
MISSOURI RIVER
ELLIS ISLAND
MAPLE ISLAND
CORA ISLAND
ST. LOUIS DISTRICT
ST CHARLES COUNTY
ST LOUIS COUNTY
MADISON COUNTY
ILLINOIS
MISSOURI
East Alton
Wood River
Roxana
Hartford
LOW WATER OVERFLOW DAM
Cahokia Creek Diversion Channel
CHOUTEAU, NAMEOKI, AND VENICE DRAINAGE AND LEVEE DISTRICT
EAST ST LOUIS AND VICINITY
LEGEND
Project flood protection constructed (52ft. grade)
Other levees
Crushed stone road on levee

Protected Area

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Protected Urban/Industrial Area

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Existing Project

Wood River Levee System Features:

- 163 relief wells
- 26 closure structures (road and rail)
- 7 pump stations
- 41 gravity drains

Many project features have reached or are nearing the end of their design life

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Problems and Objectives

Problem –

Potential for levee system failure will increase without design deficiency correction and comprehensive reconstruction

Objective –

Determine work needed to prevent flood damages and flood related costs by restoring operational functionality of the levee system

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Alternatives Considered

- Three basic courses of action for the system components
  - No Action
  - Refurbish
  - Replace

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Design Deficiency

Reconstruction

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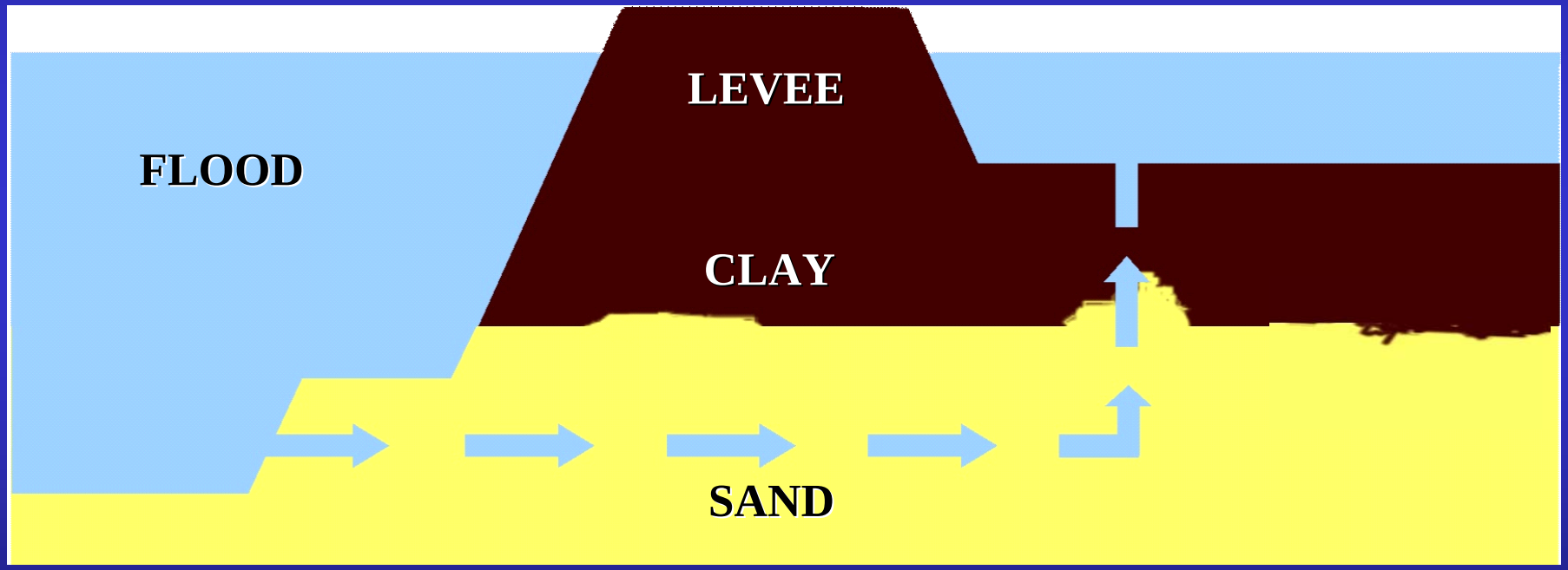
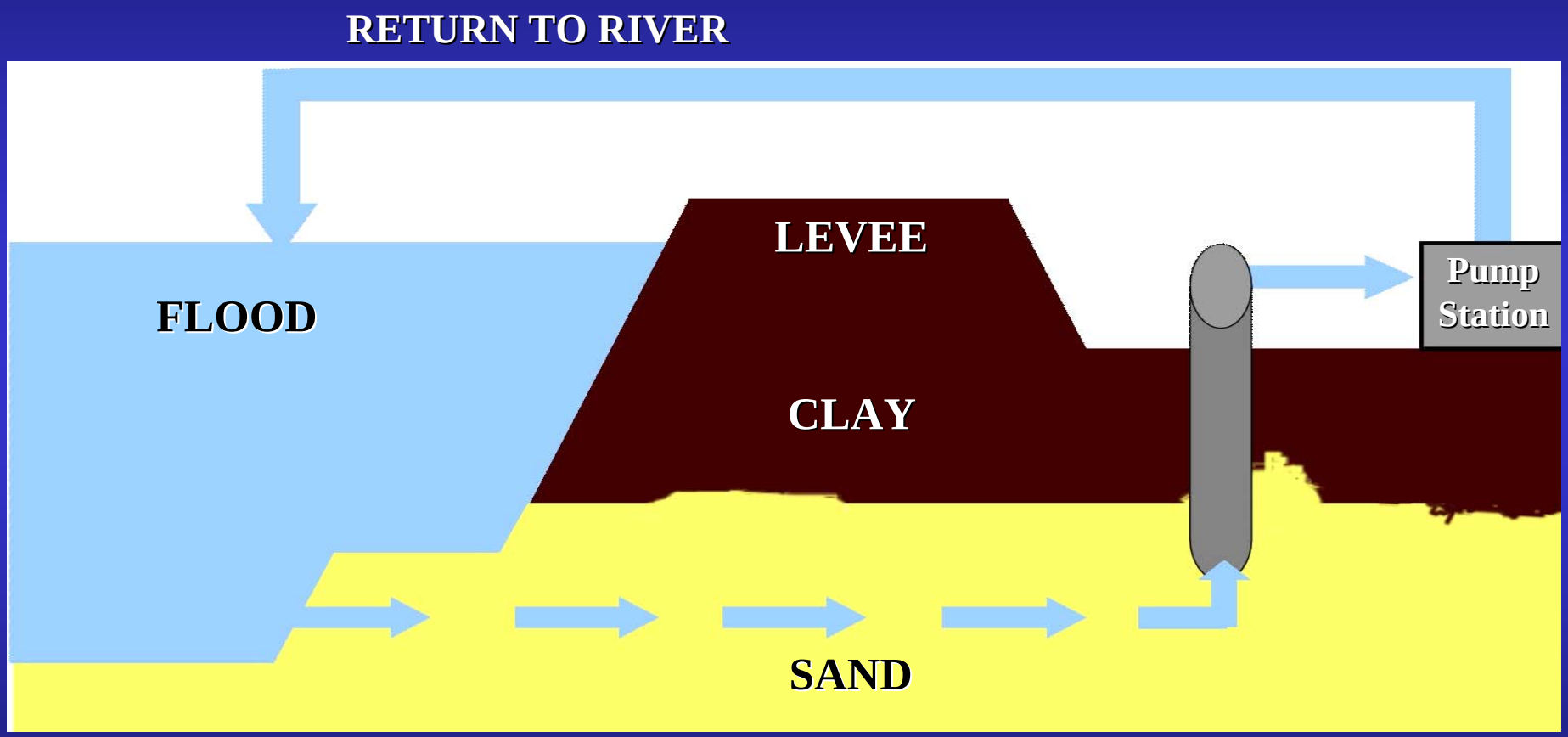
Wood River Levee System
Relief Wells

No Relief Well
Inoperable Pump Station



Relief Well



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Design Deficiency

- Relief Wells
  - Inadequate Number of Wells
  - Poor Function of Existing Wells
- Recommended Plan
  - Replacement of 163 existing relief wells
  - Construction of 60 new relief wells

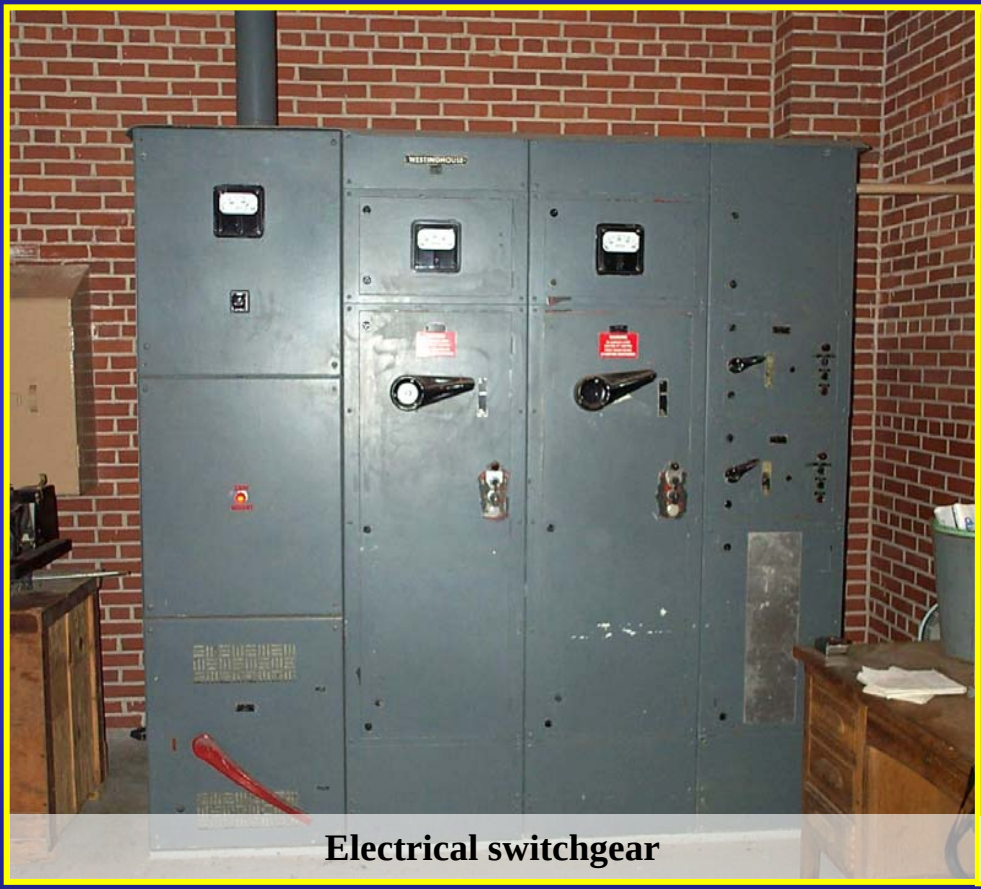
Reconstruction

EC 11-2-183 (31 March 2002) states:

"Older projects that are properly operated and maintained by non-Federal sponsors but are no longer performing satisfactorily primarily due to their advanced age may be considered for reconstruction. The proposed work will insure that the project continues to deliver the full benefits intended by Congress at the time of authorization; will not expand or change the authorized scope, function, or purpose of the project, and is not operation and maintenance typically associated with project or corrective work required due to improper maintenance on the part of the non-Federal sponsor."

Closure Structures

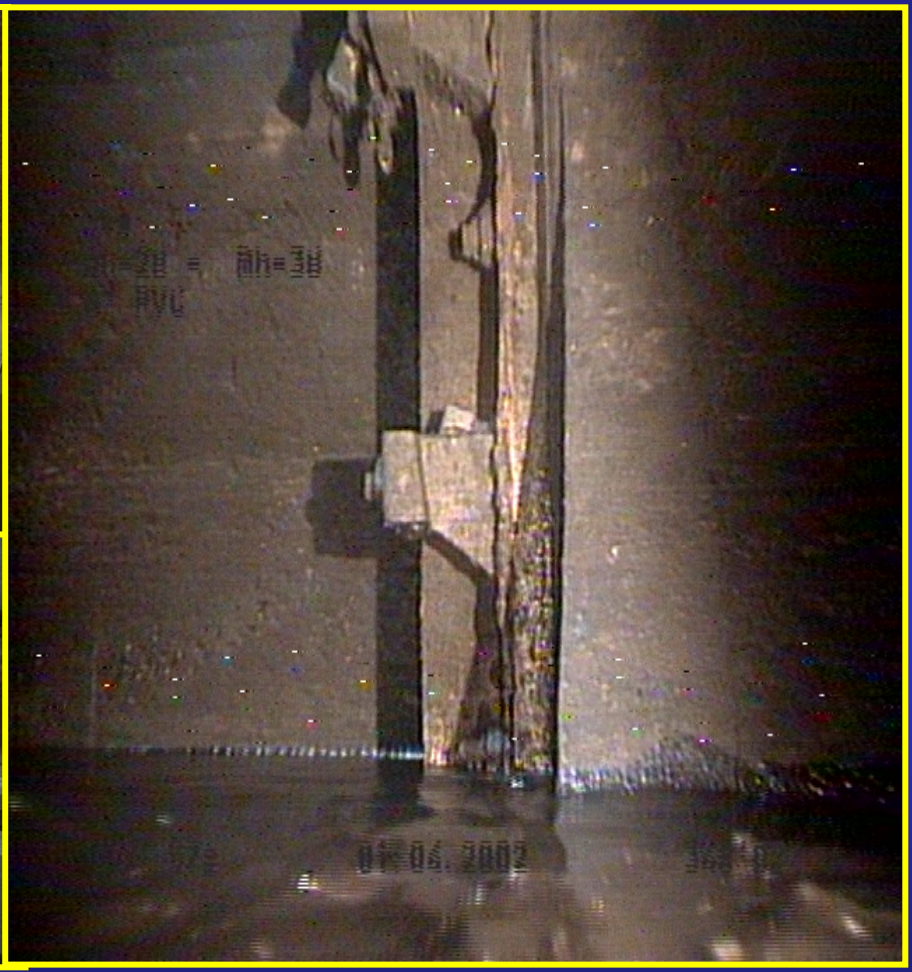
Pump Stations



Electrical switchgear

Pump

Pump Station Gates



Gravity Drains

Wood River Levee System
72” Pipe Failure, January 2005

Recommended Plan Reconstruction

- Pump Stations
  - Electrical equipment replacement
  - Pump reconstruction / replacement

- Miscellaneous structural work
- Sluice Gates – reconstruction/ replacement

Recommended Plan Reconstruction

- Gravity Drainage Corrugated Metal Pipes -
  - 24” or less diameter – replace
  - 30” or larger diameter – line
- Gates
  - Replace gate stems, guides, and hoists
  - Refurbish sluice gate slides and frames, and flap gates
- Gatewell structures
  - Miscellaneous structural repairs

Recommended Plan
Reconstruction

- Concrete Structures
  - Removal / replacement of closure structure monoliths and floodwalls
  - Gate sill replacement
  - Gate seal replacement
  - Approach apron removal and replacement

- Gates
  - 11 gates to be refurbished
  - 5 gates to be replaced
  - 3 gates to be removed and openings backfilled

Recommended Plan Cost

Limited Reevaluation Report	$ 1,800,000
Correct Design Deficiency	$ 10,900,000
Reconstruction	$ 16,400,000
Total Project	**$ 29,100,000** [1]

[1] Federal share 65% ($18,900,000) and non-Federal share 35% ($10,200,000)

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Independent Technical Review (ITR)

(conducted by Vicksburg District)

- MCACES did not include cost escalation through construction
  - MCACES was revised; comment resolved
- Rehab vs replacement of pumps was questioned
  - Rehab has been previously successful; comment resolved
- Need to make sure report information tracks from one part to another
  - Report was revised to be consistent

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Agency and Public Comments

- Public meeting was held during the public review of the draft report
- Project was strongly supported
- Project is supported by local industry and local government
- Project has congressional support

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HQ Policy Review

- Alternative Formulation Briefing was held in April 2004 hosted by St. Louis
- Local stakeholders, HQ, MVD, and MVS attended AFB
- The team visited the project site

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Comments
HQ Policy Review

- Without Project Conditions with Respect to Failure Modes
- Sponsor OMRR&R
- Design Deficiency for Relief Wells
- Reconstruction of Existing Project Features
- Incremental Justification for Project Features
- Cost Sharing – WRDA 86 (original vs. amended)

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Systems/Watershed Context

- Loss of Wood River Levee System would create environmental catastrophe
- A reliable Wood River System also protects East St. Louis Levee District to the south
- Project supports both navigation and flood damage reduction

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Environmental Operating Principles

- The Environmental Assessment for the project contained a Finding Of No Significant Impact
- Project supports environmental responsibility
- Replacement of existing relief wells avoids environmental issues associated with well restoration

Sponsor and Local Stakeholder Support

Mr. Leroy Emerick

President, Wood River Drainage and Levee District

Board of Commissioners

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by
Colonel Al Bleakley
Deputy Commander
Mississippi Valley Division

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Rationale for MVD Support

- Concur with MVS Commander's findings and recommendations
- Report complies with all applicable policies and laws in place at this time
- Anticipate a favorable response to the draft Chief's Report
- Plan supported by sponsor and congressional delegation

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Certification of Legal and Policy Compliance

- Legal certification by MVS Counsel on 27 July 2005
- Technical and policy compliance:
  - MVK performed ITR
  - All ITR comments resolved

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MVD Quality Assurance Activities

- MVD reviewed ITR comments/responses to ensure appropriate resolution
- Active participation by vertical team
- Worked with MVS to successfully resolve HQ review comments
- MVS certified that project is technically, legally, and policy compliant
- MVD concurs that project is technically, legally, and policy compliant

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MVD Recommendation

- Approve Final Feasibility Report
- Release report for State and Agency Review
- Complete Chief's Report NLT 31 Dec 05

Civil Works Review Board

Significant Policy Review Concerns

Wood River Levee System Reconstruction Project Madison County, Illinois

Steve Cone
Office of Water Project Review
Policy and Policy Compliance Division

Washington, DC – October 25, 2005

Wood River Levee System Reconstruction Project

Areas of Policy Concern:

- Without Project Condition – Failure Modes
- Sponsor OMRR&R
- Design Deficiency
- Reconstruction Measures
- Incremental Justification
- Cost-sharing

Without Project Condition – Failure Modes

Concern: Initial AFB materials did not account for the different modes and probabilities of failure of the various project components.

Reason: Guidance for CW projects requires accurate without project condition and proper characterization of risks and consequences of various project features in order to determine damages, benefits, and overall justification.

Resolution: District revised engineering and economic analysis to appropriately measure risks and consequences of failure due to under-seepage, closure structure problems, gravity drains, and internal drainage.

Resolution Impact: Concern resolved

Sponsor OMRR&R

Concern: AFB materials were not sufficiently clear as to whether sponsor had performed all OMRR&R responsibilities or if some of the recommended measures should be local responsibility.

Reason: Corps policy requires that sponsor perform all OMRR&R. The Corps does not recommend actions that are result of deficient local OMRR&R.

Resolution: Draft and final report clarified local performance of OMRR&R. Determination was made during review that the design deficiency corrective measures and the reconstruction measures proposed are appropriate for Corps recommendation.

Resolution Impact: Concern resolved

Design Deficiency

Concern: The AFB materials and Corps guidance were not clear as to whether under-seepage problems associated with inadequate relief wells could be considered a design or construction deficiency or part of reconstruction subject to new authority.

Reason: Corps can undertake only design/construction deficiencies corrections under original project authorization. Reconstruction requires new authority.

Resolution: After considerable debate and coordination, a determination was made that the under-seepage problems associated with clogged and inadequate number of relief wells was a design/construction deficiency.

Resolution Impact: Concern resolved

Reconstruction Measures

Concern: AFB materials and Corps guidance were unclear as to whether the problems with gate closures, gravity drains, and pump stations should be reconstruction measures, design deficiencies.

Reason: Corps must determine if measures are design deficiencies under existing authority or reconstruction works warranting new authorization.

Resolution: Report improvements and internal discussions and debates resulted in review team reaching consensus that gates, drains, and pumps should be reconstruction measures. Also resulted in the development of new policy guidance.

Resolution Impact: Concern resolved

Incremental Justification

Concern: The AFB materials did not present incremental justification for the major project features. - e.g. relief wells, closure structures, gravity drains, pump stations

Reason: Corps policy requires that incremental justification be demonstrated for all project elements/features.

Resolution: Draft and final reports revised to present incremental justification for all major project features.

Resolution Impact: Concern resolved

Cost-Sharing

Concern: The AFB materials did not clearly allocate costs to design deficiency and reconstruction measures. Design deficiency measures were incorrectly recommended for 75/25 cost sharing.

Reason: All project measures whether design deficiency or reconstruction should be recommended with WRDA 86, as amended cost sharing (e.g. 65/35).

Resolution: Draft and final report allocated costs between design deficiency corrections and reconstruction measures. 65/35 cost sharing recommended for all measures.

Resolution Impact: Concern resolved

Additional Information

Reconstruction Authorizations in House and Senate WRDA Bills:

Authorize Reconstruction of Levees in Illinois and Missouri, including Wood River without requirement for economic justification and with original project cost sharing.

New Policy Guidance Memorandum dated August 16, 2005:

Memorandum provides policy guidance on reconstruction of Corps structural flood damage reduction projects for which non-Federal interests are responsible for operation, maintenance, repair, rehabilitation and replacement (OMRR&R).

HQUSACE Policy Compliance Review Team RECOMMENDATION

Release the report and EA for S&A Review

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Lessons Learned

- Important to have vertical team involved early, especially in uncharted territory
- Value of face to face meetings and site visits to reach level of understanding and consensus
- Keep ITR comments focused on technical issues, address editorial comments separately
- Document needs to be clear
  - Nomenclature should not be confusing
  - Presentation in document should be clear and concise

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Lessons Learned

- Early and continual vertical team involvement is key when dealing with new policy issues (e.g., reconstruction authority)
- Vertical team site visit and interaction with project sponsor increased the level of understanding of the area's problems/opportunities
- ITR by another district provided value to overall product
- Clear, concise documentation reduces comments