

RECLAMATION

Managing Water in the West

Reclamation Meeting on *Managing for Excellence*

**Breakout Session:
Evaluation of Engineering Standards**

Sacramento, CA
November 13-14, 2006



U.S. Department of the Interior
Bureau of Reclamation

Action Item 16

Task: “Analyze Reclamation’s engineering standards; both the appropriateness of them and how they are applied internally and externally.”

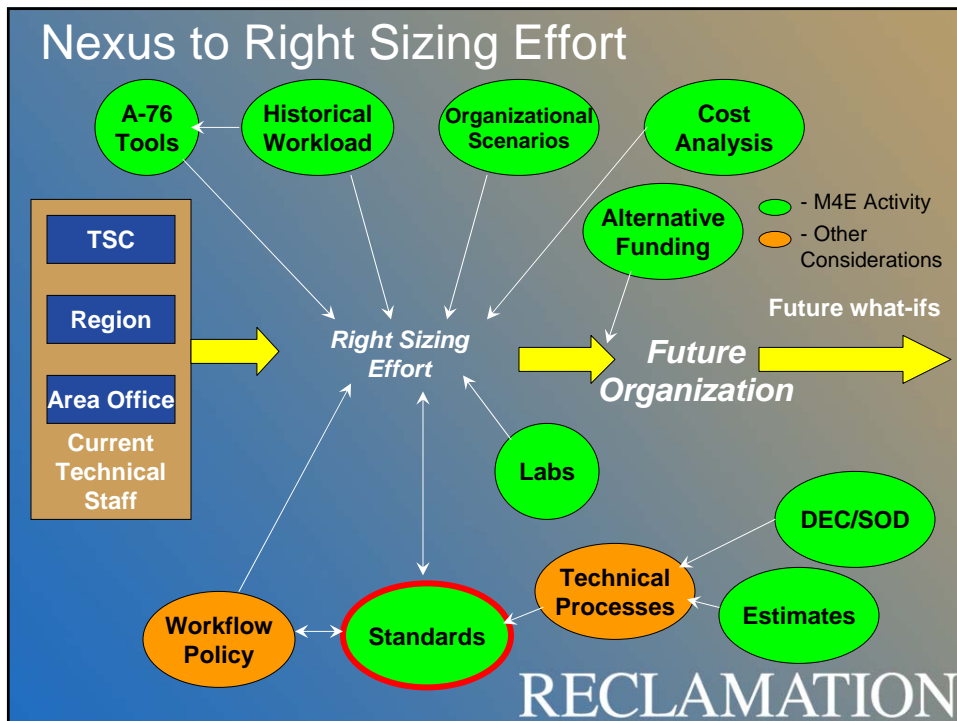
- Report will be provided to Action Item 12 for consideration in the “right-sizing” effort

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Managing Construction and Infrastructure in the 21st Century Bureau of Reclamation

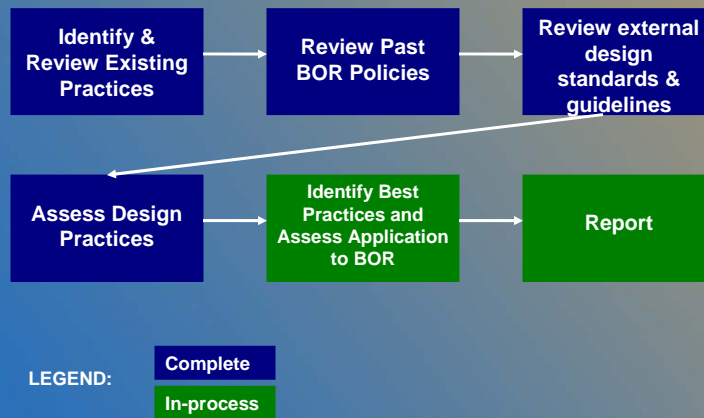
- **Finding 1a.** “Reclamation-wide directives, known as Instructions, were withdrawn, although in some cases they continue to be used for guidance in the field. ...”
“Consistently implementing Reclamation’s mission will require clear statements of policy and definitions of authority and standards.”
- **Finding 1b.** “Reclamation’s customers and other stakeholders want close contact with empowered Reclamation officials. They also want consistency in Reclamation policies and decisions and decision makers with demonstrated professional competence.”

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Team 16 Process

- Process



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Approach

- Define Scope of “Engineering Standards”
 - Design Data Collection
 - Design Standards
 - Design Process
 - Close Out Process
- Define Target Audience
 - Internal Design Providers and Design Clients
 - External Design Providers and Design Clients
 - Water User Organizations
 - Federal and State Agencies and Large Utilities
 - Architect and Engineering Firms (A&E)

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Study Methodology

- **Collect and Review Existing Internal/External Data**
- **Survey Design Providers and Design Clients**
 - Three questionnaires were developed to gauge experiences, practices, and perceptions of Reclamation engineering standards and processes vs. other standards and processes
 - Reclamation (TSC, Region, Area & Field Offices)
 - External (Other Owners -- Federal & State Agencies, Large Utilities)
 - Customer (Water User Organizations)
- **Conduct Face-to-Face Interviews**
- **Collect Electronic Questionnaire Responses**

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Elements of Good Engineering

- **Design Data Gathering**
- **Design Standards**
- **Design Process**
- **Close Out Process**

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Survey Results – Design Data Gathering

- Reclamation has guidelines in place that work well when they are followed
- External owners tend to have in-house created design data standards in place
- A&E's are more likely to rely solely on the judgment of the designers in determining design data needs on a case-by-case basis.

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Survey Results – Design Standards

- Most Reclamation offices take into consideration the old standards developed under the Reclamation Instructions supplemented by industry/national standards
- A&Es use industry/national and federal standards and apply professional judgment to their application.
- Other owners tend to use a blend of industry/national, Federal agency and internal standards.
- All owners & A&Es recognize old BOR standards and the majority still refer to them either in developing their standards or during their engineering processes.
- Most Water User organizations believe BOR standards are higher and more conservative than industry standards. However, most recognized the necessity for higher standards particularly for high hazard/risk structures.

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Survey Results – Design Process

- All entities (including Reclamation) involve the client organization in the design process
 - BOR Clients (both internal and water users) prefer early and thorough involvement in all phases of the process for facilities that affect their operations or impact them financially
- Effective communication is necessary to good client relationships and to achieve consensus on design process
- When consensus cannot be reached, internal and external design organizations generally defer to the client, unless there is an important safety consideration to be addressed

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Survey Results – Design Process (cont.)

- Perception of Design Process: Generally BOR's designs are more expensive to produce and perhaps more expensive to construct compared to A&E designs. Most thought they are more robust and result in a longer project life and lesser O&M costs. This is especially true for high risk (economic and safety) facilities.

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Survey Results – Close Out Process

- Internal & external organizations surveyed recognize the value of a close out and lessons learned process. Few have a mandatory and well defined process.
- Owners with sufficient financial resources and repeated portfolio of work tend to practice a close out process and collect lessons learned.

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Next Steps

- Identify Best Practices and Assess Application to BOR (November 2006)
- Prepare Report (December 2006)

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