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Managing Water in the West

Federal Hydropower Collaboration: Future Challenges and Possibilities

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Overview

- 58 Power Plants
- 2nd Largest Hydropower Producer in United States
- 42 Million MWH Annual Average Generation
- 10 Percent of Power in West
- Covers 17 Western States

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USACE/Reclamation Memorandum of Agreement

- Joint Leadership Meeting in Folsom, CA June 7-9, 2006
  - Co-champions identified for each Area of Concern
  - Special emphasis on Hydropower, Asset Management and Environmental Stewardship
  - Co-champions to review goal statements and recommend actions
  - Agreed to sign an MOA to facilitate execution of Support Agreements
  - MOA Signed August 2006
  - Annual meetings

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Challenges

- Internal
  - Budgets
  - Improving the quantity of the product that is delivered
  - Aging workforce
  - Aging infrastructure
- External
  - Climate Change
  - ESA Compliance
  - Expanding power customer interaction

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Internal Challenges

- **Budgets**
  - **Federal appropriations budget flat**
  - **Power customers' costs escalating**
  - **Increased pressures to keep costs down**
  - **Increased scrutiny on all aspects of operations**

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Internal Challenges cont.

- Improving the quantity of the product that is delivered
  - Pressure from increased reliance on hydropower for ancillary services.
  - Improving quantity of power through intelligent replacement
    - Life Cycle analysis
    - Efficiency improvements
    - Smarter outages

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Internal Challenges cont.

- Average O&M cost increase pressure
- Decreasing the cost of the product delivered
  - Regulatory pressures
    - Personnel Safety practices
    - Material Safety
    - Grid Reliability
  - Internal Reporting requirements
    - Agency accomplishment documentation
    - Justification for expenditure

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Internal Challenges cont.

- Decreasing the cost of the product delivered (con't)
  - Reducing the cost of maintenance in the facility
    - Reducing time at the wrench
    - Smarter maintenance techniques
    - Maintenance Management
  - Staffing costs
    - Technical knowledge
    - Retirements and transfer of knowledge
    - Staff mobility

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Internal Challenges cont.

- Aging Workforce
  - 42% retirement eligible in next 5 years
  - Need for knowledge transfer
  - Changing culture of younger workers
  - Lack of mobility of younger workers

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Internal Challenges cont.

- Approximately 50 percent of Reclamation's dams were built between 1900 and 1950.
- Ninety percent of its dams were built before current state-of-the-art foundation treatment and filter techniques were incorporated in embankment dams to control seepage.
- Of the 457 dams that Reclamation manages, 370 are located in areas that could endanger life and property.
- Reclamation’s emphasis is placed on the risk management assessments conducted by the Safety of Dams program.

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External Challenges

- Climate Change
  - Scientific indications- decreasing precipitation and increasing temperatures
  - Macro climate modeling limited
  - Precipitation extremes are catastrophic
  - Public perception assumes the worst of outcomes
  - Media exposure intensifying the debate

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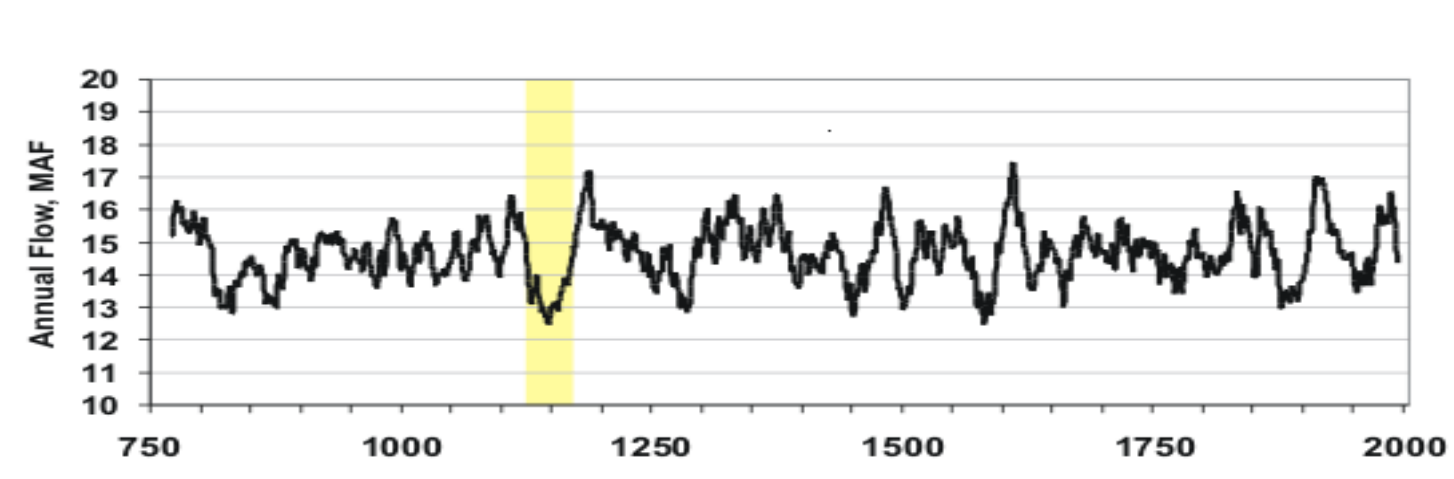
Climate Change



- *Meko et al. (2007) reconstruction of annual streamflow for the Colorado River at Lees Ferry, 762-2005, 20-year running mean in black (annual values not shown). The yellow bar highlights the severe and sustained mid-1100s drought.*

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Hydropower Reservoirs Exacerbate Climate Change

- **Hydropower cannot, a priori, be automatically assumed to emit less greenhouse gas than the thermal alternatives, *World Commission on Dams- June 10, 2000***
- **Methane Belches in Lakes Supercharge Global Warming, Study Says, *National Geographic News- September 6, 2006***
- **Geologists have proposed that much of the methane in the atmosphere is a result of emissions from swampy wetland areas such as the Florida Everglades, *National Geographic News- September 6, 2006***

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External Challenges cont.

- Endangered Species Act compliance
  - Erosion of generation flexibility
  - Loss of value for hydro electric production
  - Perception of impacts greater than reality
  - Lack of public appreciation for hydropower

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Glen Canyon Dam High Flow Test

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Glen Canyon Dam High Flow test

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External Challenges cont.

- Expanding Power Customer Interactions
  - Managing for Excellence
  - Input on improvements to Reclamation power efforts
  - Ideas on prioritization of program goals
  - Support from external audiences

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Possibilities/Opportunities

- Enhanced partnerships with other hydro generators
  - In particular with the Corps of Engineers, TVA, and BPA
- Active involvement of power customers
- Greater understanding of power operations by resource agencies
- Greater appreciation for the value of hydropower by the general public.

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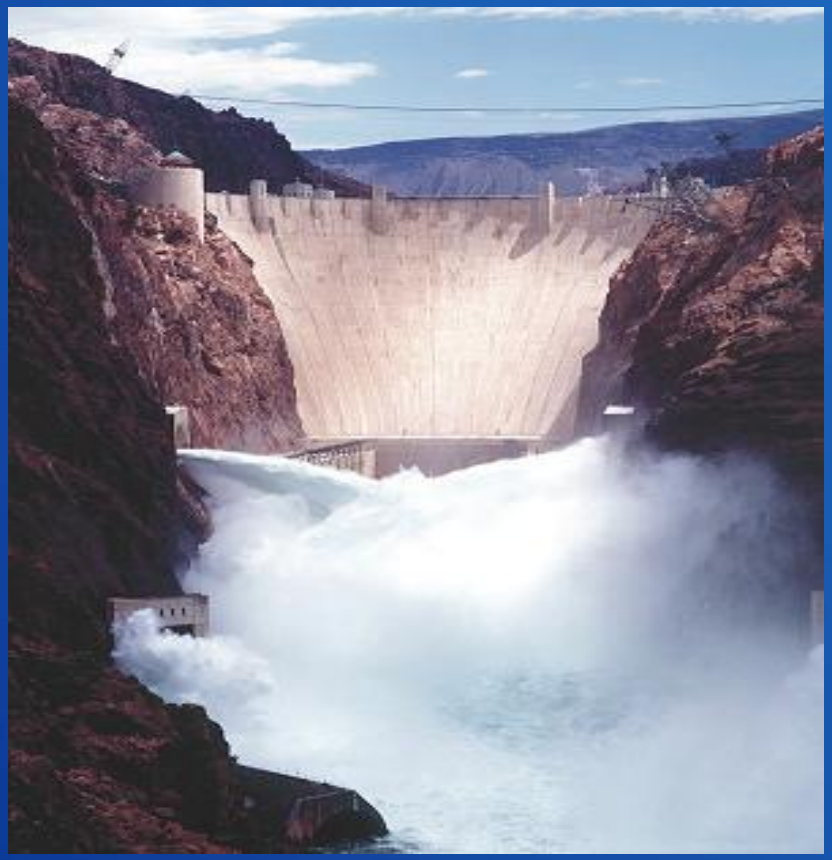
Hoover Dam



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