US Army Corps of Engineers

Hydropower Infrastructure: Challenges and Opportunities

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Generation Capacities and Corps Projects

All Types (2007)

- Coal: 48.5%
- Natural Gas: 21.6%
- Nuclear: 19.4%
- Petroleum: 1.6%
- Hydro Conventional: 6.0%
- Other Renewables: 2.5%
- Other: 0.5%

Hydropower and the Corps

- FERC Licensees: 53.5%
- TVA: 5.4%
- USBR: 15.3%
- Others: 2.9%
- Corps of Engineers: 22.9%

Corps Hydropower Capacity by Divisions

- NWD-NP: 62.6%
- SWD: 8.3%
- SAD: 10.9%
- LRD: 4.5%
- MVD: 1.1%

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Hydropower Capability Overview

- Largest producer of renewable energy in the USA
- Generates approximately 77 billion KWh of renewable energy annually, enough energy to electrify 11 million households or 39 cities the size of Washington, DC
- 75 power plants with 353 generating units
- 21,000 MW of capacity, largest in USA

- Generates over $5 billion in gross annual revenue;
  Total capital investment ~$21 billion
- 60 FERC licensed power plants at Corps dams with 2,300 MW capacity
John Day Dam: 16 Units - 2,485
400 MW Dworshak Dam: Largest single unit – 220 MW
Old Hickory L&D: 100 MW
Regional Plant Distribution

- **NWD**: 29 total plants
- **SAD**: 18 plants
- **LRD**: 10 plants
- **SWD**: 14 plants

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Existing National Hydropower Fleet is Aging

- ~40% of USACE hydropower fleet is 49 yrs or older
- ~40% of Non-Fed Turbines are 80 year old
- ~23% of TVA Turbines are 50 year old
Hydropower Unit Forced Outages

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Target level

FORCED OUTAGES

3 per. Mov. Avg. (FORCED OUTAGES)
Hydropower Peak Availability

Target level is 98%

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Stockton Turbine Blade Failure

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Barkley Unit 1 & Unit 4 Generator Failure

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Hydropower Program
Near Future Challenges

• Sustaining an aging infrastructure reliably with constrained budgets; Average age – 48 years
• Implementation of a sound asset management strategy
• Maintaining an adequate technical workforce
• Meeting new NERC electric reliability compliance standards
• Declining performance metrics
  - Forced outages twice industry standards
  - Peak unit availability 8 to 10 percent below industry standards

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Hydropower Program
Near Future Opportunities

• Hydropower Modernization Initiative – Reliability Restoration and Capacity Upgrade Potential
• USACE Civil Works Transformation – Hydropower Infrastructure role in a sustainable ecology
• Key Collaborations/Agreements with Strategic Partners
• P3?

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Questions?

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