

I N N O V A T I O N T H R O U G H C O L L A B O R A T I O N



Centre for Energy Advancement
through Technological Innovation

Program Update Presented at:

2008
Northwest Hydro Operators
Regional Forum
MANAGEMENT ISSUES

The CEATI Hydro Program



Dam Safety



Hydraulic Plant Life



Water Management

Over 50 Participating Hydro Utilities

CEATI Hydro Participation – North America

FERC Licensees

- Allegheny Energy Supply
- Ameren UE
- American Electric Power
- Brookfield Power Corporation
- **Chelan County Public Utility District**
- **Douglas County PUD**
- Duke Energy
- **Eugene Water and Electric Board**
- **Grant County Public Utility District**
- Hetch Hetchy Water & Power
- KeySpan
- New York Power Authority
- **Portland General Electric**
- Sacramento Municipal Utility District
- **Seattle City Light**
- Southern California Edison
- Southern Company
- **Tacoma Power**
- TransAlta Energy Corporation
- TransCanada Pipelines

US Government

- **Bonneville Power Administration**
- California Department of Water Resources
- Tennessee Valley Authority (TVA)
- **U.S. Army Corps of Engineers**
- **U.S. Bureau of Reclamation**

Canada

- ALCAN Inc.
- BC Hydro Generation
- Churchill Falls (Labrador) Corporation
- Columbia Power Corporation
- EPCOR
- FortisBC Inc.
- Hydro-Quebec
- Manitoba Hydro
- Natural Resources Canada
- New Brunswick Power Generation Corporation
- Newfoundland and Labrador Hydro
- Nova Scotia Power
- Ontario Power Generation
- SaskPower

CEATI Hydro Participation – Worldwide

Europe

- Deltares
- E.ON Wasserkraft GmbH
- Electricite de France (EDF)
- ELFORSK
- ESB (Electricity Supply Board)
- Fortum Generation AB
- Scottish and Southern Energy
- Vattenfall AB

Australia/New Zealand

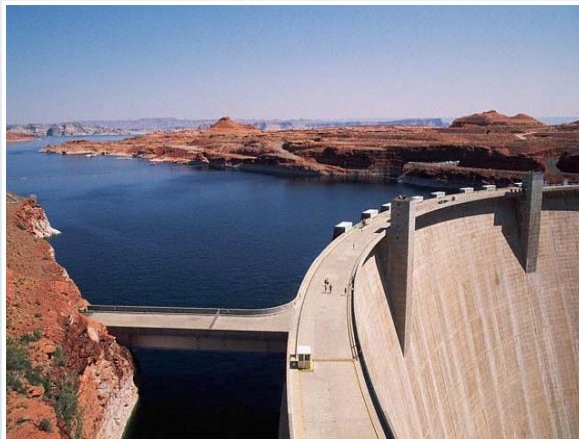
- Hydro Tasmania
- Mighty River Power
- Meridian Energy
- Snowy Hydro Limited

Africa

- ESKOM

Dam Safety Interest Group (DSIG) (Dam Safety Managers/Civil Engineering Managers)

- » The Dam Safety Interest Group is composed of Dam Owners who jointly sponsor research & development projects designed to help assess and improve the safety of dams.
- » Today, the DSIG is represented internationally by participants from Canada, the United States, Australia, Sweden, the Netherlands, France, the United Kingdom and Germany.



DSIG Spotlight Project: Dam Monitoring and Data Analysis Management – Best Practices

» Project Status:

- To be Initiated
- Request for Proposal (RFP) to be distributed to potential contractors in the industry.



DSIG Spotlight Project: Dam Monitoring and Data Analysis Management – Best Practices

- » **Task 1: Literature Review**

- » **Task 2:**
 - **Development of Model Surveillance and Monitoring Program**

 - **Development of Plans for Summarizing Dam Monitoring Instruments**

- » **Task 3: Summaries, Conclusions and Recommendations**

DSIG Project Listing

- » Some of the recently completed, on-going and upcoming projects in the DSIG include:
 - Erosion and Breaching of Embankment Dams: Phase 1 Compilation of Databases (T032700-0207)
 - Non Destructive Testing of Bar or Cable Anchors Embedded in Concrete Dams (T042700-0208)
 - Debris Management in Spillways and Waterways During Floods (T052700-0209A)
 - Multifractal and Physically Based Estimates of Extreme Floods (T052700-0212)
 - **People, Technology and Organization – Application to Emergency Preparedness Plans (T072700-0213)**
 - Manual for Use of Temperature for Seepage Investigation and Monitoring of Embankment Dams (T062700-0214)
 - Flow Discharge Equipment Reliability (T0727-00-0215)
 - **Gauging the Effectiveness of Dam Safety Programs (T082700-0218)**

DSIG Workshop 2009 – March 24-25, 2009

- » **Case Studies – Learning from Dam Incidents and Failures**
 - Organized in Collaboration with the FERC
 - The goal is to be a periodic international coordination and cooperation leading to developmental and research needs in dam safety and provide training opportunities.



Hydraulic Plant Life Interest Group (HPLIG)

(Asset/Plant/Operations/Mechanical/Electrical Engineering Managers)

- » The HPLIG is a collaborative, technology-focused program designed to assist hydroelectric utilities in their efforts to:
1. Lower capital and operations costs,
 2. Extend equipment life,
 3. Improve efficiency,
 4. Increase reliability and reduce outage times for equipment repair and maintenance.
 5. Improve safety and environmental performance,
 6. Improve risk based asset management decision making, and
 7. Improve performance evaluation and benchmarking techniques.



HPLIG Project Listing

- » Some of the recently completed, on-going and upcoming projects in the HPLIG include:
 - Optimum Timing for Generator Rewinds (T032700-0321A)
 - **Update of the Hydroelectric Turbine Generator Erection and Alignment Guide (T052700-0329)**
 - **Hydro Plant Operation and Maintenance Safety (T072700-0351)**
 - Dissection, Condition Assessment and Analysis of Windings Taken From Failed In Service Units (T082700-0356)
 - **Turbine Generator Shaft Stress Analysis – Methods and Limitations (T082700-0357)**
 - Short Converging Intake Flow Project: Kootenay Canal Comparative Flow Tests (T082700-0358)
 - Replacement of Petroleum Based Turbine Oils in Hydropower Plants with Water Based Oils

Water Management Interest Group (WMIG) (Water Managers/Hydrologists/Inflow Forecasters)

- » The scope of the Water Management Interest Group is to focus on the development of methods & tools required to optimize hydraulic processes while maintaining safe and environmentally–friendly operations.

- » **Focus**
 - Watershed Management/Water Use Planning
 - Meteorology/Hydrology
 - Data Acquisition
 - Operational Modeling and Optimization
 - Hydroelectric Operation and Environmental Concerns
 - Risk Management
 - Improved Safety of Waterways



WMIG Technology Review and Project Listing

- » Some of the recently completed, on-going and upcoming technology reviews and projects in the WMIG include:
 - Accuracy of Inflow Forecasting Tools (T072700-0208)
 - The Impacts of Climate Change on Hydroelectric Generation (T072700-00409)
 - Water Management Process Benchmarking (T072700-0410)
 - Full Cost Environmental Accounting (T072700-0411)
 - Hydrometric Gauging (T082700-0412)
 - Hydrologic Data Quality Assurance (T082700-0414)

WMIG 2008 Workshop – October 8-9, 2008 in Montreal, QC

» **Climate Change – Impacts on Hydroelectric Water Resource Management**

- Bridging the Gap between Scientists and Practitioners: Short, Medium and Long Term Forecasting



» **Presentations will focus on:**

- 1) Technical Challenges for Adaptation to Climate Change
- 2) Adaptation on Short/Medium/Long Term Planning



For More Information

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