

CEATI | Hydropower Operations and Planning

Although hydraulic generation has evolved through many decades of technological change and environmental regulation, it continues to demonstrate an enviable track record of outstanding performance. It now operates in a world of unparalleled change with new paradigms which include: the competitive pressures of deregulation; increasing consumer reliance on hydropower's relative low cost and greenhouse gas emission-free source of energy; high stakeholder expectations; and ever-increasing investor, government and public scrutiny. Many of the changes and challenges facing the industry such as climate variability and greenhouse gas emissions are beyond the control of, but still impact, the hydropower water manager.

The long-term strategic direction of this group will be to develop new and innovative technological approaches and options to support the role of the water manager in managing and enhancing the underlying fundamental value of the industry, and to provide a knowledge-based leading edge technological resource to assist the hydropower industry in meeting its many new challenges.

Topics & Issues

1. Watershed Management
2. Meteorology and Hydrology
3. Data Acquisition, Validation and Dissemination
4. Hydraulics and Hydraulic Structures
5. Planning, Operation, Outage, and Risk Management
6. Hydropower Operation and Environmental Concerns
7. Waterways and Public Safety
8. Power Production Planning
9. Integration of Non-Dispatchable Resources

Technical Advisors



Mr. Charles Bach received his Bachelor Degree in Atmospheric Sciences & Mathematics from SUNY Albany, and his Master's degree in Meteorology from Florida State University. He worked for 36 years for the Tennessee Valley Authority. He has also been the Project Manager for an Environmental Impact Statement for a fossil plant and upgrades to TVA's aeration equipment. Mr. Bach is currently the President of Big Red Water Management Consultants, providing Water Management services to national and international customers. Mr. Bach has been involved with the CEATI Hydro Program since 2004, helping to lead and direct several initiatives such as the Hydro Operations and Planning Benchmark as well as the Dissolved Oxygen Working Group.



Mr. Marcel Paul Raymond holds a Master's degree in Computer Science and Operations Research from the University of Montreal. He has 32 years of experience within Hydro-Québec. He has been actively involved in planning the operations of the utility's system of generation, transmission, and interconnection. He has gained international recognition by managing projects in Brazil, USA, Poland, and Russia. After his retirement from Hydro-Québec in 2009, Mr. Raymond has become an energy consultant. His services as an expert have been used in many files presented before the Quebec Energy Board. In addition, he has been consulted on matters related to the hydroelectric projects of Lower Churchill in Labrador and of Three Gorges in China.



Projects

Watershed Management

- Water Management Road Map

Meteorology and Hydrology

- Accuracy of Inflow Forecast
- The Impact of Climate Change on Hydroelectric Generation
- Impact of Wind, Temperature, and Other Environmental Factors on Reservoir Evaporation Losses
- Benchmarking of Ensemble Streamflow Forecast

Hydropower Operation and Environmental Concerns

- Full Cost Environmental Cost Accounting

Improved Safety of Waterways

- Waterways Public Safety Survey
- Waterways Public Safety Incident Report Database

Hydraulics and Hydraulic Structures

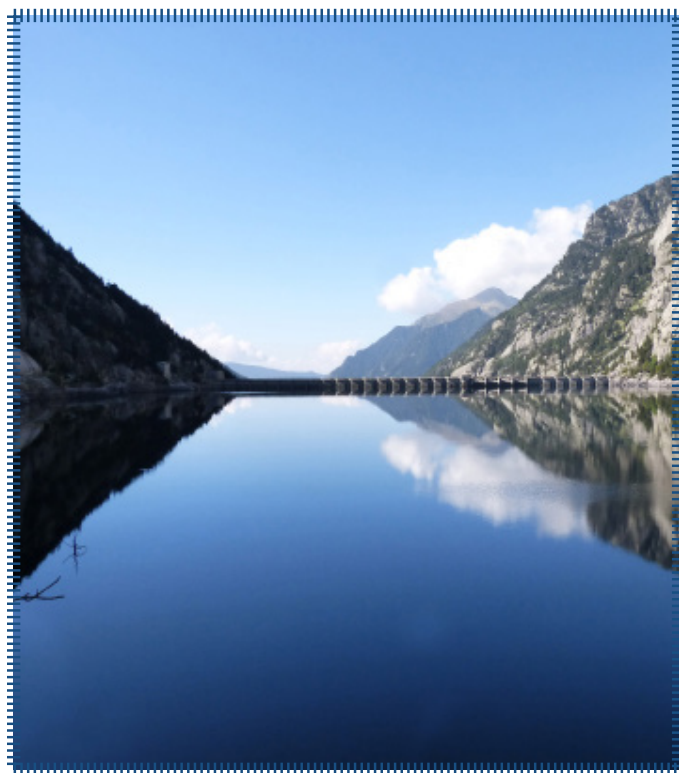
- Shallow Water Ice Profiler
- Comprehensive River Ice Simulation System

Planning, Operation, and Risk Management

- Outage Planning Maturity Matrix
- Technology of Real-Time Measurement of Turbine Flow
- Benchmarking Performance Optimization
- Risk Informed Decision Making Framework for Hydro Project Operation under High Inflow Conditions: Accounting for Uncertainty and Risk
- Hydropower Operations and Planning Maturity Matrix

Data Acquisition, Validation, and Dissemination

- Applied Statistical Analysis Techniques for Hydro Generation & Runoff
- Review of Data Screening Methods for Discharge/Inflow Time Series
- Water Management Data Dissemination and Reporting
- Integration of Satellite and Radar Estimates into Rain and Snow Gauge Networks
- Hydrologic Data Quality Assurance
- Hydrometric Gauging



Annual Activities

- 2 Meetings
- 1-2 Workshops
- Monthly Webinars & Conference Calls
- Weekly Information Exchange

Working Groups

- Energy Imbalance Markets Working Group
- Key Performance Indicators Working Group
- Climate Change Operations Risk & Adaptation Working Group

*Participation is open to Electrical Utilities, Independent Power Distributors, Government Agencies, and Universities.