

Conference Program

HYDRO

Looking at Hydropower through a Modern Lens:
Versatility, Operability, and Sustainability

March 6-7, 2018
Tucson, AZ

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Engineers and Consultants



Conference at a Glance

OVERVIEW

CEATI's 2018 Hydropower Conference will bring together experts from all areas of hydropower, from dam safety, to plant reliability and maintenance, to hydropower operations and planning, in order to discuss the key challenges currently facing the hydropower industry: versatility, operability and sustainability. Hydropower has been used to provide flexibility and balancing to the power grid for many years, but the non-energy benefits of hydropower are often overlooked. This conference will look at the economic viability of hydropower, and the challenges facing many owners today including operating under extreme conditions, maintaining aging equipment, and the dam safety implications when dealing with changing operations in today's market.

THEMES

1 Changing Operations & the Role of Hydropower in Balancing the Grid

- Market driven operations and impacts
- Changing ramping requirements
- Rough zone operations
- Costs of providing ancillary services
- Maintenance and outage impacts on availability
- Dam safety implications
- River operations implications

2 Hydropower Moving Forward

- Economic viability and opportunities
- Quantifying the non-energy benefits
- Dealing with environmental, regulatory and security issues

3 Fit-for-Service of Critical Equipment

- Gates, hoists, valves, penstocks, water boundaries
- Inspection, condition assessment, monitoring
- Data analysis
- Fostering innovation
- Reducing costs and improving efficiencies

4 Extreme Conditions

- High inflows, droughts, seismic events
- Short/medium/long-term planning strategies
- Coordination and communications with internal and external stakeholders

5 Knowledge Retention & Transfer of Institutional Knowledge

- Succession planning strategies
- Training programs and tools
- Recruiting techniques and apprenticeship programs

GOALS

1. Learn from each other;
2. Provide knowledge and procedures necessary to recognize and manage new challenges;
3. Identify areas where additional research may improve our knowledge of potential failure modes;
4. Identify ways to ensure that the knowledge of the past is available for the future, and previous mistakes are not repeated;
5. The continuation of global communication, coordination, collaboration and advancement.



Day 1 - Hydro Program

March 6th, 2018

12:00 - 1:30 Networking Lunch - Arizona Ballroom

Session 1 (Pavilion) - Changing Operations and the Role of Hydropower in Balancing the Grid

- 1:30 **The State of the Hydro Industry and What's Coming Up - Looking into the Crystal Ball** *Alejandro Moreno, USDOE*
- 2:00 **The Evolving Role of Hydropower: Balancing the Integration of Renewables and Energy Storage and Security in Variable Hydrologic Conditions** *Bill Girling, IHA*
- 2:30 **The Flexibility of Hydropower in the MISO Market - Ameren's Osage Power Plant** *Phil Thompson, Ameren*

3:00 - 3:30 Coffee Break - Arizona Ballroom

Session 2A (Pavilion) - Hydro Plant Reliability, Operations & Planning

Session Chairs: Chuck DeVane, Southern Company and Marcel Paul Raymond, CEATI

- 3:30 **Campbell River Hydroelectric System Engineering Investigations**
Stephen Hart, Hatch & Stephen Rigbey, BC Hydro
- 4:00 **Increasing Dissolved Oxygen Levels at High Rock Dam**
Neal Simmons, Cube & Olivier Teller, GE Renewable Energy
- 4:30 **Cost of Operation for Maintenance and Refurbishment Planning**
Christine Monette, Andritz Hydro

Session 2B (Sonoran Room 2) - Dam Safety

Session Chairs: Kim Pate, Seattle City Light and Roger Raeburn, PacifiCorp

- 3:30 **Geotechnical Condition Assessment and Risk Management**
Darren Beckstrand & Chris Carpenter, Cornforth Consultants
- 4:00 **Structural Vibrations Simple Approach to Surveillance, Monitoring, and Understanding**
Zee Duron & Guy S. Lund, Gannett Fleming
- 4:30 **Installation and Verification Monitoring of High Capacity Multi Strand Tendons for Dam Anchoring**
Mark Sinclair, Traylor SRG

Session 2C (Sonoran Room 1) - Emerging Surveillance Technologies

Session Chairs: Annick Bigras, Hydro-Quebec and Hugh Armitage, Southern Company

- 3:30 **A Customized Approach to Photogrammetric Modeling of Hydro Electric Infrastructures**
Glen Hanscom, New Brunswick Power & Cody Bradley, UNB
- 4:00 **UAV Project: Flights Taken, Lessons Learned, Future Research Needs**
Erin Foraker, USBR
- 4:30 **Underwater Asset Inspection and Monitoring using 3D Imaging Sonar Solutions**
Scott Walters, Teledyne Marine

5:00 - 7:00 Networking Reception - Arizona Ballroom

Agenda is subject to change without notice.

Day 2 - Hydro Program

March 7th, 2018

7:00 - 8:00 Breakfast - Arizona Ballroom

Session 3A (Pavilion) - *Hydro Plant Reliability & Dam Safety: Fit for Service of Critical Equipment*
Session Chairs: Greg Lewis, Duke Energy and Kim Pate, Seattle City Light

8:00 **Robust Turbine Design for High Cycling and 0 to 100% Power**
David-Alexandre Bouffard, GE Renewable Energy

8:30 **Rehabilitation of the Burrungubugge Intake Shaft: Maintaining One of the Civil Engineering Wonders of the Modern World**
John de Groot, Snowy Hydro & Scott F. Arnold, Fyfe

9:00 **Trunnion Bushing Replacement at Wanapum Dam**
Ray Ellis & Dave Mishalanie, Grant County PUD

9:30 **The John Hart Project: Redeveloping an Aging Plant to Meet the Modern Environmental Regulatory Setting**
Josh Vines, SNC & Chris Fulton, BC Hydro

Session 3B (Sonoran Room 2) - *Hydropower Operations & Planning*
Session Chairs: Ann McManamon, BPA and Kevin Gawne, Manitoba Hydro

8:00 **The Use of Forecasting in Low Flow Operating Protocols**
Steven Nebiker & Casey Caldwell, HydroLogics & Liz Parcell, American Electric Power

8:30 **Modeling the Flexibility of Hydro Assets and Pairing Up with Solar/Wind to Meet Specific Customer Loads**
Bruno Benedetti, Brookfield & Brian Krolak, HDR

9:00 **Manitoba Hydro's Perspective on Climate Non-Stationarity**
Efrem Teklemariam, Manitoba Hydro

9:30 **Valuing Hydropower Improvement and Modernization Projects**
Boudewijn Neijens, Copperleaf

10:00 - 10:30 Coffee Break - Arizona Ballroom

Session 4A (Pavilion) - *Dam Safety, Operations & Planning: Dealing with Extreme Conditions*
Session Chairs: Chuck Bach, CEATI and Hugh Armitage, Southern Company

10:30 **A Review of Hydrologic Hazards Calculation Frameworks**
Shaun Carney, RTI & Haden Smith, United States Army Corps of Engineers

11:00 **Churchill River Diversion Fuse Plug Near Operation Event**
Kevin Gawne, Manitoba Hydro

11:30 **Non-stationarity and Risk Management: A Case Study from the 2017 Thanksgiving Flood in the Skagit Valley**
John Chandler, Puget Sound Energy

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Day 2 - Hydro Program

March 7th, 2018

Session 4B (Sonoran Room) - Hydro Plant Reliability & Maintenance

Session Chairs: Greg Lewis, Duke Energy and Chuck DeVane, Southern Company

10:30 Life Management of Generator Rotor Spiders through Structural Testing and Fitness-for-Service

Eric Scheibler, Quest & Jesse Sipple, BDI & Brett Bickford, CCPUD

11:00 HiPot Testing of Generators

Ben Lavrinnoff, Kinectrics

11:30 End-winding Vibration Monitoring for Hydro-Generators

Andre Tetreault, VibroSystM & Sylvain Giroux & Denis Bussieres, Rio Tinto Alcan

12:00 - 1:30 Lunch - Arizona Ballroom

Session 5 (Pavilion) - Looking through a Modern Lens - the Issues of Today and Their Implications for Tomorrow

1:30 Panel Discussion: USDOE Insights into the Value and Costs of Hydropower and Pumped Storage

Panelists: Vladimir Koritarov, ANL; Abhisek Somani, PNNL; Brennan Smith, ORNL

Moderator: Tim Welch, USDOE Water Power Technologies Office

- Developing a Valuation Framework for Pumped-Storage Hydropower
- Hydropower Value Study: Foundational Elements and Research Roadmap
- Hydropower Fleet Intelligence: Using What We Know and Don't Know About Reliability, Cost, and Condition to Improve Asset Management

2:30 Spillway Investigations and Assessments - Oroville and Beyond

Stephen Rigbey, BC Hydro

3:00 - 3:30 Coffee Break - Arizona Ballroom

**Prize draw will occur at 3:20 in the Arizona Ballroom.*

3:30 Panel Discussion - Moving Forward with Potential Failure Mode Analysis (PFMAs)

Panelists: Stephen Rigbey, BC Hydro; Dave Panec, CADWR; Dave Capka, FERC

Moderators: Bruce Muller & Gus Tjoumas, CEATI

4:20 How the Changes in the Industry will Impact DSIG, HOPIG, and HPLIG

5:00 Adjournment



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Spring 2018 Industry Conference

3 Tracks - 1 Venue

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Important Information

Registration fees include proceedings package, breakfast, breaks, lunches and reception where indicated on the schedule.

- Please check if you wish to be contacted about allergies or other dietary requirements.

Prices are in USD. Charges will appear as 'CEATI International Inc' and are subject to applicable taxes and fees.

All cancellations received at least 60 days prior to event will be subject to a \$200 processing fee. There will be no refunds granted after this date. Delegate substitution is permitted at no extra cost.

Please note that all names registering for the event will be added to CEATI's mailing list. If you do not wish to be included in this electronic outreach, please click on the 'unsubscribe' button in the email to remove yourself.

In the spirit of industry networking, your email may be shared with other conference participants. If you do not wish to have your email shared, please contact events@ceati.com.

By attending, you acknowledge that there may be photographs or videos taken of you during this event, and you consent to the use of these photographs or videos in future CEATI communications.

Completed registration forms can also be sent by email to events@ceati.com or by fax to (514) 904-5038.

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All conference guests are eligible for a preferred rate of \$199 USD a night subject to availability. To receive the preferred rate, please mention the special convention rate for the CEATI International meeting. Preferred rate only available until February 1st, 2018.

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