

Technology Innovation Project



Project Brief

TIP 414: CEATI – Hydraulic Plant Life Interest Group (HPLIG)

Context

The hydro-electric industry's highly competitive environment places a growing need on safe, environmental, and cost-effective production. There is also an increasing emphasis on the requirement for capital investments in equipment and parts replacement to ensure outage times for equipment repair and maintenance are optimized.

Return on investment will need to be protected and enhanced in part by program improvements such as refurbishment or replacement of inefficient units with new high efficiency ones; improvements in the design of intake, flow passage, and tailrace hydraulics; and better tools for measuring productivity improvements achieved with planned initiatives.

Further ongoing reductions of capital outlay to ensure the continued production of low cost energy will require the development of improved maintenance and repair techniques. Such techniques are seen as using new processes and materials to extend equipment life. These procedures can speed up the repair process to reduce outage times, while condition assessment, equipment diagnosis, and monitoring can optimize "just in time" maintenance.

Topics & Issues

- Hydropower Technology
- Condition Assessment & Inspection Guidelines
- Asset Management
- Maintenance Programming & Reliability Performance Monitoring
- Work Force Productivity & Safety
- Environmental Performance
- Regulatory Affairs

Annual Activities

- 2 Meetings
- 1-2 Workshops
- 5-7 Conference Calls
- Weekly Information Exchange

Why It Matters

Membership provides a forum to network with industry peers to share common concerns related to the Topics and Issues encompassed by this interest group.

By comparing best practices and sharing problem solving methods with the membership, BPA develops an independent perspective of its performance in the related areas and enables a culture of continuous improvement.

Finally, collaboration leverages BPA's investment by providing access to results from many large projects that BPA could not support alone.

Goals and Objectives

The goal of the *Hydraulic Plant Life Interest Group (HPLIG)* is to bring together participants from hydropower generation and related industries to identify immediate design, operational and maintenance issues and challenges and, through collaboration on specific projects, deliver cost-effective technological, asset management and training solutions to meet today's industry needs. The scope of the interest group's efforts is detailed in the *Hydraulic Plant Life Interest Group Business Plan*.

BPA also participates in Hydro-amp (Asset Management Partnership) to develop condition assessment guides for hydro equipment. This project provides a level-playing field by using a common language and supports development of industry standards for condition assessment. BPA, USACE and USBR are all users of this guide.

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Project Start Date: January 2020

Project End Date: December 2020

Links

www.ceati.com/HPLIG

Leverage

BPA's contributions are leveraged at a ratio of 8:1. This annual membership provides BPA access to reports and results of HPLIG projects.

For More Information Contact:

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About CEATI

The Centre for Energy Advancement through Technological Innovation (CEATI) is a user-driven organization committed to providing technology solutions to its electrical utility participants. Together, they collaborate and act jointly to advance the industry through sharing and developing practical and applicable knowledge.

In addition to facilitating information exchange through its programs and industry conferences, CEATI International brings its partners together to collaborate on technical projects with a strong practical focus. It also develops customized training solutions to fit the participants' needs. CEATI leverages a large network of technology suppliers, with representatives from 1,500 companies worldwide.

Current HPLIG Projects

Hydropower Technology

- Operation of Hydro Generators with Bypassed Stator Coils
- Vibration and Alarm Settings for Hydro Machines with Hydrodynamic Guide Bearings
- Hydraulic Unit Governor Upgrading Guide
- Grounding and Bonding Best Practices
- Safe Protection of Hydro Unit Operating at Runaway Speed
- Hydro Turbine Generator Vibration and Balancing Field Guide

Capital and Maintenance Investment

- Commissioning Guide for Turbines and Generators
- Optimum Timing for Generator Stator Rewinds Based on Generator Condition Assessment and Statistical Methods
- Hydroelectric Turbine-Generator Units Guide for Erection Tolerances and Shaft System Alignment
- Brushgear Maintenance Guide
- Penstock Maintenance and Repair Guide

Maintenance Programming and Reliability

- Hydro Generators General Maintenance and Inspection Guide
- Staff Management of Hydraulic Generating Stations
- Penstock Inspection and Assessment Guide
- Electrical Overhaul Guide to Hydroelectric Turbine Generators
- Mechanical Overhaul Guide for Hydroelectric Turbine Generators

- Hydro Generator Start/Stops and Cycling Costs
- Cost of Start-Stop Operations

Work Force Productivity and Safety

- Key Performance Indicators and Tracking R&D Performance
- Training for Hydro Plant Staff (Including Web-Based Approaches)
- Best Practice Guide for Planning and Executing Hydro Overhaul and Retrofit Projects/Optimization of Rehabilitation

Environmental Performance

- Criteria for the Identification and Selection of Environmentally Acceptable Lubricants
- Dissolved Oxygen Monitoring Technologies Applicable to Hydraulic Generating Station Reservoirs, Tailraces, and Spillways

Regulatory Affairs

- Overview of Security Technologies for Hydropower Facilities
- Fire Protection Lessons Learned, Study of Hydroelectric Fire Probabilities & Fire Risk Assessment
- Fire Protection and Suppression in Hydroelectric Plants

BPA participates in several of the projects listed above.

