

National Hydropower Association



Operational Excellence

Program Update

Northwest Hydro Operators Forum
May 20, 2014



Presentation Outline

- I. OpEx Defined
- II. Future / Why is OpEx Important?
- III. Results To Date
- IV. Web Site
- V. Questions



OpEx Defined



OpEx is:

- NHA program and member benefit with a separate web site and login
- Voluntary sharing of critical information, best practices and lessons learned
- A tool that can be used for managing aging assets and a work force in transition
- Educational resource for workforce development

OpEx' scope:

- Best Practices, Event Reports and Lessons Learned in the areas of
 - Safety – Dam, Employee, and Public
 - Maintenance
 - Operation
 - Environmental
- **OpEx does *not* cover compliance and regulatory matters**

A key objective of OpEx is to prevent a defining event in the hydropower industry.

OpEx Defined

Examples of Defining Events in Hydro History



South Fork Dam Catastrophic Failure
Johnstown, PA Flood
May 31, 1889



Sayano-Shushenskaya Hydro Plant
August 17, 2009 Failure



Watts Bar Hydro Plant Fire
September 27, 2002

Future / Why is OpEx Important?



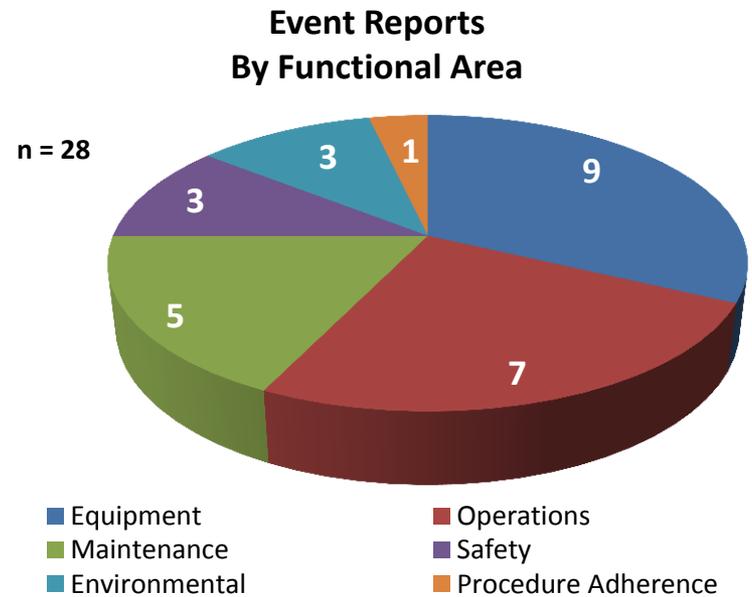
- The average age of a hydroelectric facility in North America is 54 years and as equipment wears and maintenance schedules increase and components are replaced or refurbished, operational reliability is also an increasing concern for many owners and operators.
- At the NHA Annual Conference in April, the Secretary of Energy, Ernest Moniz, announced a new Hydropower Vision with the goal of doubling the industry by 2030.
- OpEx will bridge this gap, providing a forum to ensure that the existing fleet continues operating efficiently and reliably, while also recognizing the tremendous growth in our future and serving as a resource for new entrants into the hydropower industry.
- The OpEx program can be used as a vehicle for knowledge transfer and subject matter in workforce development.
- NHA's OpEx program is the first of its kind in the industry and we seek to maintain the U.S. hydropower industry's leadership worldwide.

Results To Date

Achievements to Date

28 Event Reports from: 13 Utilities including 5 reports from the Federal sector, 1 from an equipment supplier

- Two reports contained lessons learned and recommendations from an employee injury.
- 18 reports describe forced outage or equipment failure events
- 6 events were Human Performance failures



Results To Date



Sample Event Report List

Control Room Fire

ISO-Phase Bus Failure

GSU Oil Leak

Crane Coupling Failure

Failed Strainer Housing

Broken Rotor Fin

Clearance Violation

Loose Generator Rotor Pole Wedges

Rotor - InterPole Connector Failure

Lower Turbine Shrink Ring Crack

Penstock Hydraulic Valve Seal Failure

Results To Date

Event Reports - Results to Date – Part II

To prevent a repeat event the ERs contain

- 103 Corrective Actions
- 52 Lessons Learned
- 41 Recommendations

Lesson Learned - Example

“The investigation concluded that this event could have been prevented by performing preventative maintenance as per industry standards and manufacturers recommendations. With an adequate procedure and the necessary personnel training this incident would have been prevented.”



Web Site Development



Sapere Consulting, Inc. began development activities in late February.

Development Guidelines

- Look and Feel of NHA's website
- Easy To Use and Navigate
- Event Report Format Based on Existing Format
- Input via Cut and Paste Text
- Attachment of Photographs and Videos to Event Reports
- Utilization of mainstream software environment

Public Landing Page



The screenshot shows a website header with the NHA OpEx logo on the left and 'Login Register Now' on the right. The main content area features the NHA logo and the text 'National Hydropower Association Operational Excellence'. To the right is a 'Latest News' section with two items: 'NHA Annual Conference April 28-30, 2014, Washington, DC' and 'OpEx Demo, Conference Session 5C April 29, 2014, 11:00am - 12:30pm'. At the bottom of the main content area are two buttons: 'Who should register?' and 'Register Now'.

NHA's Operational Excellence (OpEx) program is a voluntary event reporting system that receives, distributes, archives, and catalogs Operational Excellence Information (OEI) and any resulting best practices and lessons learned.



Why is this important?

As the industry contends with aging assets and an aging workforce, OpEx and the event reporting system will provide a trusted and reliable database of historical and current operational issues and serve as an educational and training resource for future personnel.

Join the Operational Excellence Program by registering today. It's simple.

Public Landing Page

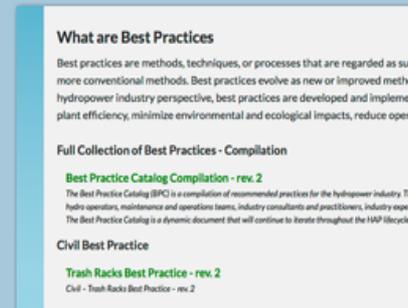
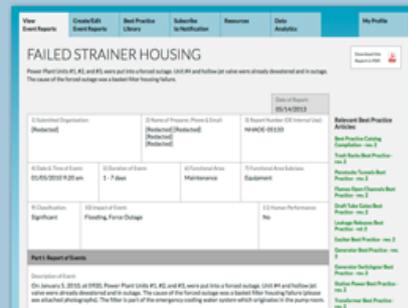
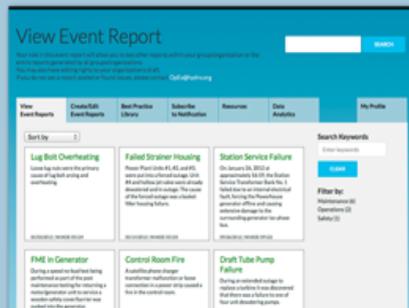


How does OpEx work and what are my benefits?

NHA's OpEx Event Reporting System module captures important events using a simple to use form. This form stores the event in a relational database that can support drafting, revision control, and multi-user contribution. Best of all, the reporting system is mobile friendly.

The event report is drafted and submitted for approval. NHA coordinators will review, categorize, and redact any sensitive information. Once the event is approved for publication the event report can be searched based on criterias, and exported to various formats for viewing or distribution. You can even subscribe to certain categories to be notified via email of any future related events that are published into the reporting system.

In addition to the Event Reporting System, NHA's OpEx program has collected a clearinghouse of important knowledge from various sources and organizations. This is the Best Practice Library module, and as it continuously grows you can search to find relative information based on your needs and download important PDFs for viewing.



View Event Report

Your role in this event report will allow you to see other reports within your group/organization or the entire reports generated by all groups/organizations.
You may also have editing rights to your organization's draft.
If you do not see a report posted or found issues, please contact OpEx@hydro.org.

View
Event Reports

Create/Edit
Event Reports

Best Practice
Library

Subscribe
to Notification

Resources

My Profile

Sort by

mobiletest

Mobile

20140501 | NHAOE-51220142230

Sample Event

lasdkjf,lkjas;dlkfjasdf

20140501 | NHAOE-5122014932

Lug Bolt Overheating

Loose lug nuts were the primary cause of lug bolt arcing and overheating.

20130504 | NHAOE-05134

Search Keywords

Enter keywords

Filter by:

Maintenance (6)
Uncategorized (2)
Operations (1)
Safety (1)

Failed Strainer Housing

Station Service Failure

FME in Generator

Create / Edit Event Reports



Create or Edit Reports

Your role in this event report will allow you to see other reports within your group/organization or the entire reports generated by all groups/organizations. You may also have editing rights to your organization's draft. If you do not see a report posted or found issues, please contact OpEx@hydro.org

- [View Event Reports](#)
- [Create/Edit Event Reports](#)
- [Best Practice Library](#)
- [Subscribe to Notification](#)
- [Resources](#)
- [My Profile](#)

Reports [Add New](#)

[All \(12\)](#) | [Published \(10\)](#) | [Draft \(1\)](#) | [Pending \(1\)](#) | [Trash \(4\)](#)

12 items

<input type="checkbox"/>	Title	Author	Categories	Tags		Date	Blocked?
<input type="checkbox"/>	mobiletest	aloynes	Uncategorized	—	0	12 hours ago Published	
<input type="checkbox"/>	Test3 - Draft	aloynes	Uncategorized	—	0	2014/05/12	

Create / Edit Event Reports



View
Event Reports

Create/Edit
Event Reports

Best Practice
Library

Subscribe
to Notification

Resources

My Profile

Add New Report

Short Overview *

Please describe the event report under 250 characters.

Report Number

NHAOE-5132014469

Date of Report

Post Restriction

Posts are not blocked by default. [Edit](#)

Block this post

Publish

Save Draft

Preview

Status: Draft

Visibility: Public

Submit for Review

Categories

All Categories [Most Used](#)

Create / Edit Event Reports

Impact of Event

- Equipment Damage Death Fire Flooding Force Outage Injury
 Misoperation Release to Environment Unplanned Release of Water Other

Impact of Event - Other

Human Performance

Part 1 - Report of Events - Description

For the event, what equipment or system(s) were involved and where did it occur, what work or activity was being done, what was the result, what or how did the event start or how was it found, and any other information you believe needs to be included.

 Add Media

 Insert Slideshow

B *I* ABC           

Best Practices



What are Best Practices

Best practices are methods, techniques, or processes that are regarded as superior for delivering a particular outcome compared to more conventional methods. Best practices evolve as new or improved methods are established for conducting business. From a hydropower industry perspective, best practices are developed and implemented with the intent to continually improve unit and plant efficiency, minimize environmental and ecological impacts, reduce operating costs, and ensure appropriate safety measures.

Quick Lookup: |

Full Collection of Best Practices - Compilation

Best Practice Catalog Compilation - rev. 2

The Best Practice Catalog (BPC) is a compilation of recommended practices for the hydropower industry. The Catalog is organized by system and equipment. Sources for the Catalog include: hydro operators, maintenance and operations teams, industry consultants and practitioners, industry experts, and manufacturers of equipment used in and around the hydropower plants. The Best Practice Catalog is a dynamic document that will continue to iterate throughout the HAP lifecycle.

Civil Best Practice

Trash Racks Best Practice - rev. 2

Civil - Trash Racks Best Practice - rev. 2

Penstocks Tunnels Best Practice - rev. 2

Civil - Penstocks Tunnels Best Practice - rev. 2

Resources



Resources

If you do not see a resource link, want to make a suggestion or found issues, please contact OpEx@hydro.org.

View Event Reports	Create/Edit Event Reports	Best Practice Library	Subscribe to Notification	Resources	My Profile
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Non-Profit and NGO Resources

- **National Hydropower Association**

NHA's website has a wealth of hydro information and should be the starting point for anyone looking for a broad range of quality information on policy, legislation, regulatory, statistics, and industry news, to name a few – hydro.org

- **Electric Utility Cost Group**

EUCG provides a forum for the electric utility industry to share information and benchmark against those in their class – <http://www.eucg.org/>

- **Electric Power Research Institute**

EPRI, Inc. conducts research, development and demonstration (RD&D) relating to the generation, delivery and use of electricity for the benefit of the public – <http://www.epri.com/Pages/Default.aspx>

- **U.S. Society on Dams**

USSD works on dam engineering, construction, operation, and safety while protecting the environment. One of the goals of USSD

Next Steps

Web Site Completion

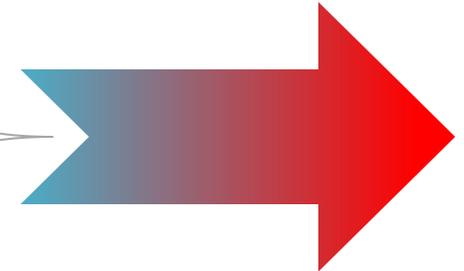
June, 2014

Taxonomy Development

Training Material Development

Best Practice Library Development

Next 6 - 12 months



Questions



OpEx – Contact Information



Further Information Contact:

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Thank you