NORTHWEST HYDROELECTRIC ASSOCIATION

2016 ANNUAL CONFERENCE

Valuing Hydropower: Making Dollars and ‘Sense’

FEBRUARY 16–18, 2016
Portland Marriott Downtown Waterfront
Portland, Oregon

www.nwhydro.org
Welcome to the 2016 NWHA Annual Conference!

Welcome … we’re glad you’re here!

We hope you’re able to take full advantage of this limited opportunity to join with area’s leading hydro professionals to examine our industry’s most current and pressing issues. Changing energy markets. Emerging legal and regulatory issues. Innovative technologies and operations techniques. These are the forces shaping Northwest hydropower and we appreciate your contributions in helping address them.

A Special Thank You

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EARD

EARD
All conference rooms are in the Lower Lobby. Throughout the conference, these rooms will be used for:

- General Session: Salons F-I
- Exhibit Area: Salons A-E and Lower Lobby
- Registration: Lower Lobby
7:00 a.m.  
**Registration Opens**  
Continental Breakfast in Exhibit Area

**8:00–8:15 a.m.**  
**OPENING REMARKS**  
**The Value Hydropower Provides**  
Steve Padula, President, Northwest Hydroelectric Association  
Licensing & Regulatory Practice Lead, McMillen Jacobs Associates

8:15–9:15 a.m.  
**Utility Roundtable: The Future of Our Hydro Resources**  
Join us for the opening conference roundtable discussion with prominent Northwest hydropower executives who will provide their insight and perspectives on the future role of hydropower in the generation mix, as well as their thoughts on developing new hydro and threats to the existing hydropower resources.  
**Moderator:**  
Steve Corson, Director of Corporate Communications, Portland General Electric  
**Panelists:**  
Kieran Connolly, VP of Generation Asset Management, Bonneville Power Authority  
Bill Gaines, Director & CEO, Tacoma Public Utilities  
Lisa Grow, Senior VP of Power Supply, Idaho Power Company  
Maria Pope, Senior VP of Power Supply, Operations & Resource Strategy, Portland General Electric

9:15–10:45 a.m.  
**Hydropower Innovation through the Project Lifecycle**  
This panel will cover examples of innovative concepts brought to hydropower—from new construction ideas to grid integration to maintenance and monitoring. Panelists will discuss how they have brought the latest in designs and technologies to hydropower projects at various lifecycle stages.  
**Moderator:**  
Timothy J. Welch, Moderator, Hydropower Program Manager, Wind & Water Power Technologies Office, US Department of Energy  
**Panelists:**  
Karen Studarus, Power System Engineer, Pacific Northwest National Laboratory  
Scott Spahr, Manager Generation Engineering, Snohomish PUD  
Dave Youlen, Executive VP Development, Eagle Creek Renewable Energy  
Todd D. Deligan, VP Business Development, Whooshh Innovations

10:45–11:00 a.m.  
**Break in Exhibit Area**

11:00 a.m.–12:30 p.m.  
**Managing Reservoirs for All**  
Impoundment hydropower facilities provide many benefits to the public, including recreation, flood control, water supply, navigation and irrigation. Water managers work in dynamic environments and face complicated optimization problems as they carefully evaluate their operational decisions to realize the benefits while mitigating floods and managing droughts. Inflow forecasts play a key role in successfully managing this balance. This panel provides different perspectives on operations of multi-reservoir systems with a focus on adapting to climate change.  
**Moderator:**  
Irena Netik, Director, Hydro & Wind Resources, Puget Sound Energy
Panelists:
Ken Brettmann, Senior Water Manager, US Army Corps of Engineers, Seattle District
Crystal Raymond, Climate Change Advisor, Seattle City Light

12:30 p.m.
Luncheon Session: “RAPID” Toolkit Hydropower Initiative
National Renewable Energy Laboratory (NREL), Strategic Energy Analysis Center
Elise DE George, Senior Project Leader
The Regulatory and Permitting Information Desktop (RAPID), an initiative funded by the US Department of Energy, offers one location for agencies, developers and industry stakeholders to work together on state and federal bulk transmission and renewable energy regulatory processes in a coordinated approach.

1:45–3:15 p.m.
Interspecies Conflicts: The Challenges of Managing Fish & Wildlife Interactions at Hydroelectric Projects
Habitats associated with hydroelectric projects in the NW support a variety of fish and wildlife species, some federally protected. Utilities often need to manage species with conflicting habitat requirements or species that directly compete for the same resources. Predator-prey interactions can present significant challenges for utilities trying to implement license measures to recover protected fish populations. Sometimes the solutions, if there are any, are controversial. This session presents four case studies on species interactions at hydroelectric projects.

Moderator:
Colleen McShane, Manager, Natural Resources & Environmental Planning Unit, Seattle City Light

Panelists:
Nick Ackerman, Senior Scientist, Portland General Electric
Salmon and Pacific Lamprey: Challenges with Satisfying Different Passage Preferences
Jim Chandler, Aquatics Program Supervisor, Idaho Power Company
Non-Resident Fish: Life in the Backseat
Erin Lowery, Senior Fisheries Biologist, Seattle City Light
Endangered Species Interactions in a Riverine System: Bull Trout Predation on Pacific Salmon
Nathan Zorich, Fish Biologist, Army Corps of Engineers
Everyone’s Got to Eat: Responding to Protected Animals Eating Protected Fish

3:15–3:35 p.m.
Break in Exhibit Area

3:35–5:00 p.m.
Habitat Mitigation—What Works
An increasing number of FERC licensees are implementing aquatic habitat restoration measures as part of their licenses. This is another way that dam owners can work to minimize their hydro project impacts by addressing a habitat need in their river basin. This panel of experienced restoration design professionals and license implementation managers will focus on how to have successes by addressing issues like effectiveness monitoring, cost containment, project longevity, and maintenance requirements.

Moderator:
John Esler, Project Manager Environmental Compliance & Licensing, Portland General Electric

Panelists:
Jim Webster, Senior Hydrologist, GeoEngineers, Inc.
Steve Leathe, Sr. Hydro License Compliance, Northwestern Energy
Al Solonsky, Fisheries Biologist, Seattle City Light
John Muhlfeld, Hydrologist, River Design Group, Inc.

5:00 p.m.
Adjourn / Social in the Exhibit Area
Meet NWHA Board Candidates
7:00 a.m.
Registration Opens
Continental Breakfast in Exhibit Area

8:00 a.m.
Welcome: President Steve Padula, NWHA

8:15–9:00 a.m.
Transmission: How Hydro Moves
Patrick Reiten, President & CEO, PacifiCorp Transmission

INTRODUCTION OF KEYNOTE: Todd Olson, Director of Compliance, Hydro Resources, PacifiCorp
The coming changes in renewable energy goals and greenhouse gas limits in California and the West are changing the value proposition for hydro and new regional partnerships are transforming how hydro is participating in this evolving marketplace. These changes will provide additional value to hydro and change the way our projects are operated. Find out how!

9:00–10:30 a.m.
Energy Markets – The Evolving Role of Hydro

New changes to energy markets in California and the West will have a big effect on the value of hydro and how it is dispatched. Hydro provides positive attributes like balancing and greenhouse free energy to the markets. These essential services are becoming more valuable every day in response to increasing renewable energy goals and greenhouse gas limits. Find out how these new markets have and will affect your hydro projects in the future.

Moderator:
Rick Miller, Sr. Vice President, Renewable Energy Services, HDR Inc.

Panelists:
Arne Olson, Partner, E3 - Energy and Environmental Economics
   Energy Storage Economics
Scott Martin, Director, Resource Planning, Pricing & Commodity, Sacramento Municipal Utility District
   Storage and Market Trends
Gregg Carrington, Managing Director, Energy Resources, Chelan PUD
   Marketing Northwest Power in California
Josh Jacobs, Director Load Service Operations, Puget Sound Energy
   Energy Imbalance Market

10:30–10:50 a.m.
Break in Exhibit Area

10:50 a.m.–12:00 p.m.
Risky Business – Asset Management for Aging Hydro Plants

Asset management continues to be a hot topic in the electric utility industry. The recent adoption of ISO 55000 has provided additional momentum in North America and internationally as utilities and asset owners look to improve upon their asset management programs. This panel will take a practical focus to share case studies of how three utilities apply asset management to their aging and critical hydropower assets.

Moderator:
Mike Elenbaas, Director, Asset Management Practice, Black & Veatch Corporation

Panelists:
Gordon Ashby, Resource Economic Planner, Bonneville Power Administration
Andy Hatfield, Sr. Asset Maintenance Planner, Puget Sound Energy
Rodney Pickett, Asset Management Engineering Manager, Avista Utilities
12:00 p.m.
**Awards Luncheon**
NWHA Annual Membership Meeting
Presentation of the Pamela E. Klatt Award

1:45–3:15 p.m.
**Life at Mid-License: Cruisin’ or Crisis**
The initial rush of implementing a new license is behind you and the next relicensing is in the far distant future. Is this the “sweet spot” or are there challenges unique to the middle third of a license term? Licensees share their perspectives on such aspects as changes in company and stakeholder personnel, adaptive management, new ESA listings, new “science” and how this keeps life interesting.

**Moderator:**
Allison Murray, FERC Lands Coordinator, Idaho Power Company

**Panelists:**
Tim Swant, Clark Fork License Manager, Avista
Jon Jourdonnais, Leader, Hydropower License Compliance, NorthWestern Energy
Matt Bleich, Fisheries Biologist, Tacoma Power
Eric Wolfe, Director of Special Projects, Southeast Alaska Power Authority

3:15–3:30 p.m.
**Break in Exhibit Area**

3:30–5:00 p.m.
**Working with Dam Owners Through “Our Eyes”**
This panel features four seasoned agency veterans who have worked on many settlement agreements and FERC license implementations. They will share their insights on approaches to collaborating on our hydro projects. Their varied experiences will provide licensees practical considerations to ensure that the partnerships with state and federal agencies are efficient and effective.

**Moderator:**
Patti Kroen, Principal, Kroen Consulting

**Panelists:**
Avis Newell, 401 Hydroelectric Water Quality Specialist, Oregon Department of Environmental Quality
Ann Gray, Fish & Wildlife Biologist, US Fish and Wildlife Service
Stephanie Burchfield, Fish Biologist, National Marine Fisheries Service
Kristin Bonanno, Regional Energy Coordinator, USDA Forest Service

5:00 p.m.
**Adjourn**
**Social in the Exhibit Area**
7:15 a.m.
**Continental Breakfast in Exhibit Area**

8:30–10:00 a.m.
**Emerging Legal & Regulatory Matters Impacting Northwest Hydro**
This panel will focus on emerging legal and policy issues affecting Northwest hydro, including recent federal and state legislative and regulatory developments (and the opportunities for hydro presented by such developments) as well as an update on the Columbia River Treaty negotiations.

**Moderator:**
Matt Love, Partner, Van Ness Feldman

**Panelists:**
William Holmes, Partner, K & L Gates LLP
Robert Cromwell, Power Contracts & Acquisitions, Seattle City Light
Chuck Sensiba, Partner, Van Ness Feldman

10:00–10:30 a.m.
**Break in Exhibit Area**

10:30 a.m.–12:00 p.m.
**Getting to Know Your FERC Staff**
FERC staff can be very helpful in assisting applicants and licensees with understanding the nuances of the FERC regulatory world. But knowing whom to call about what before you really need help can be critical. Join us for an engaging discussion with our panel of seasoned experts from the three major hydro related divisions at FERC. We'll learn about what they do, and also gain insight as to why FERC does things the way it does.

**Moderator:**
Steve Padula, Licensing & Regulatory Practice Lead, McMillen Jacobs Associates

**Panelists:**
Douglas Johnson, Regional Engineer, FERC Division of Dam Safety & Inspections
David Turner, Chief NW Branch, FERC Division of Hydropower Licensing
T J Lovullo, Chief, Aquatic Resources Branch, FERC, Division of Hydropower Administration & Compliance

12:00 p.m.
**Conference Adjourns**

1:00 p.m.
**Pumped Storage Workshop**
See page 10 for a detailed agenda.

4:45 p.m.
**Workshop Adjourns**
Win a HERO4 Session GoPro Camera!

Be sure and return your fully completed Evaluation Form to the Registration Desk by 12:20 on the 18th, after the last panel, to be entered into the drawing for a HERO4 Session GoPro Camera.

Mark Your Calendar!

April 7–8, 2016

Technical Seminar
Red Lion Conference Center
Pasco, Washington
Tour Included

September 21-22, 2016

Small Hydro Workshop
|Venatchee Convention Center
Tour Columbia Basin Projects
at Grand Coulee, WA

October 20-21, 2016

Fall Regional Workshop
Puget Sound Energy Auditorium & Marriott Hotel
Bellevue, Washington
Snoqualmie Falls Project Tour

February 21–23, 2017

Northwest Hydroelectric Association
2017 Annual Conference
Portland Marriott Downtown Waterfront
Portland, Oregon
1:00 p.m.–4:45 p.m.

**NWHA Pumped Storage Workshop**

**What Would It Take for Pumped Storage Hydro to be Developed in the Northwest?**

**SALONS F-I, Lower Ballroom, Marriott Downtown Waterfront Hotel**

There is no charge for the workshop, but if attendees have not already provided an RSVP prior to the conference, they should leave their name at the registration desk to be added to the attendee list.

1:00 p.m.

**Welcome**

Lisa Larson, HDR Inc.
Chair, Northwest Hydroelectric Association Pumped Storage Committee

**Introduction**

Moderator:
Tim Culbertson, Moderator
Columbia Basin Hydropower

1:15 p.m.

**Keynote:**

*State PUC Energy Storage Policy Development*

Commission Chair Susan Ackerman, Oregon Public Utilities Commission
Commissioner Ann Rendahl, Washington Utility & Transportation Commission

1:50 p.m.

**Valuing Pumped Storage Hydro – Debunking Myths, Creating Tools**

*What is needed to create a market framework?*

*What tools are needed by regulators to ascertain value & make decisions?*

- Grid Integration and Benefits
  Rick Miller, HDR Inc.

- Energy Modeling and IRPs
  Clint Kalich, Avista Corporation

- Development of Marketing Tools to Value Pumped Storage Hydro
  Patrick Balducci, Pacific Northwest National Laboratory

- Global Activities and Opportunities
  Don Erpenbeck, MWH Global

- Grid Level Storage Comparison
  Charles J. Barnhart, PhD, W. Washington University

3:00 p.m.

**Pumped Storage Project Updates**

*What is the status of the featured projects?*

*What is needed to move these projects forward?*

- **Columbia Basin Hydropower Pumped Storage Hydro (PSH) Project**
  Tim Culbertson

- **John Day Pool PSH Project**
  Brian Skeahan

- **Eagle Mountain PSH Project**
  Ginger Gillin, GEI Consultants, Inc.

- **Gordon Butte PSH Project**
  Carl Borquist, Absaroka Energy, LLC

4:15 p.m.

**Federal and Regional Policy Activity – Moving Pumped Storage Forward**

- **US Department of Energy Programs**
  Tim Welch, US Department of Energy, Wind & Water Power Technologies

- **Federal**
  Jeff Leahey, National Hydropower Association

- **Northwest Region**
  Mike Manwaring, MWH Global, Northwest Hydroelectric Association Pumped Storage Committee

4:45 p.m.

**Adjourn**
Worthington Products, Inc.
Worthington Products, Inc. is the world’s largest provider of waterway barriers used for Debris Control, Public Safety Boat Barriers and Fish Guidance Systems. Worthington’s waterway barriers are installed in over 50 countries worldwide as well as throughout the Pacific Northwest. Whether your requirement is for a 50-foot debris boom or a large boater safety barrier, you can trust Worthington to deliver quality, performance and outstanding customer service second to none. www.tuffboom.com

Whooshh Innovations
Whooshh Innovations is revolutionizing fish passage and fish rescue through our proprietary, proven, water-sparing Whooshh™ technology—moving live fish over and around barriers gently, reliably, and cost-effectively through hands-free, assisted, or hand-fed solutions. The company has a patent portfolio that includes 20 patents issued with another 100 patents pending worldwide. Whooshh now has installations in the USA and Norway, with an installation in Chile planned for 2016. www.whooshh.com

Whitney Equipment
Established in 1971, Whitney Equipment Company has been involved with many aspects of environmental projects, more recently playing a vital role in fish protection and hydro facility upgrades. Our staff consists of technical sales, engineers, and service; we cover the states of Washington, Oregon, Idaho, and Alaska. Between the manufacturers we represent and our unique capabilities, we are capable of thinking out-of-the-box and create unique solutions for unique challenges.

Wagstaff Applied Technologies
Wagstaff Applied Technologies (AT) is a Division of Wagstaff, Inc., located in Spokane, WA. AT provides electrical and mechanical engineering and manufacturing services. Fabrications to 50 tons, CNC machining to 24” x 14” x 12” and turning to 68” x 70” diameter. Also produce automated control systems with SCADA. Hydro projects: Turbine Rehabs, including Wicket Gate and Hub and Lever machining, Servomotor rebuilds, Runner modifications, Operating Ring machining oversight.

Voith Hydro
Voith Hydro Services, the premier specialist in Hydroelectric Turbine outage service with capabilities including: disassembly/reassembly, field machining, cavitation repair, replacement parts and rewind services. Specializing in on-site work; delivering innovative custom solutions, safely and efficiently, with its extensive brands and products portfolio. Voith Hydro designs, manufactures, installs and services the world’s Hydroelectric Generation systems, large and small. For all your generator, turbine, pump, electrical, mechanical, control, automation and service requirements, Voith Hydro Services.

Thordon Bearings Inc.
Thordon Bearings is the world’s leading manufacturer of high performance, long lasting bearing systems that require no oil or grease. We will reduce your environmental impact while improving overall performance, providing non-polluting bearing solutions for rehabilitation and new turbine projects. Our products are designed to be abrasion resistant, resulting in long wear life and reduced maintenance costs. We have over 30 years of experience supplying main guide, wicket gate, operating mechanism bearings and shaft seals.

Smith-Root
Smith-Root, the global leader in electric fish guidance and deterrence technology, has installed more than 65 graduated field fish barriers in North America and Europe. Our systems range from small culvert barriers for common carp deterrence to those that span large waterways and rivers to limit range extensions by invasive species. These applications help resource managers and hydropower operators redirect fish towards desirable bypass diversions and deter fish from entering tailraces, draft tubes, and intake canals.

Schnabel Dam Engineering Inc.
Schnabel is an employee-owned company offering specialized services in dam and tunnel engineering, geotechnical and geostructural engineering, and construction services. As an ENR Top 500 design firm, Schnabel is a nationally recognized leader in the field of dam and tunnel engineering, having provided over $17M in dam engineering services in the past year. Schnabel is a specialty provider for dam safety assessments, risk management, and design services for hydroelectric, water supply, and flood control dams.
PRÜFTECHNIK
PRÜFTECHNIK has provided high-tech measuring systems and services for industrial maintenance and quality assurance since 1972, setting high global standards in precision measurement and meeting needs of the modern industrial maintenance world. The German family concern, with US-headquarters in Philadelphia, boasts over 600 employees and has 20 operational sales, service, development and production sites, exporting to over 70 countries. PRÜFTECHNIK remains the market leader in shaft alignment. Its multiple award-winning systems have become industrial standards.

PennWell
PennWell Corporation is the world’s leading provider of hydropower and dam-related information. PennWell publishes HRW-Hydro Review Worldwide and Hydro Review magazines. They cover all aspects of hydropower – new development, pumped storage, dam construction, sustainability, marine hydrokinetics, and operations/maintenance. PennWell provides a free weekly electronic newsletter highlighting news from the magazines’ HydroWorld.com website. PennWell owns and organizes HydroVision International, the largest hydro event in the world, and features hydropower in its POWER-GEN events in Brazil, Russia, and Europe.

Pacific Netting Products/
Pacific Marine Flotation
Pacific Netting Products is the industry leader in design, construction, installation and service of fish and aquatic species exclusion, guidance, and collection solutions and Multi-Function booms, for debris, demarcation and security applications that protect the environment, facilities and equipment. Today PNP has over 9 million square feet of fish passage and exclusion barriers installed. Our Multi-Function Booms offer strength, savings, utility and long life. For more information contact andy@pacificnettingproducts.com or visit our booth.

Northwest Hydraulic Consultants
Northwest Hydraulic Consultants (NHC) is a firm of consulting engineers and scientists specializing in hydrotechnical engineering – hydrology, hydraulics, river engineering, sedimentation, and modeling. Since 1972, NHC has completed over 4,000 consulting assignments in North America and internationally, including numerous assignments for existing and proposed hydropower developments. NHC provides experts with a range of methods and software for hydrologic, hydraulic, sedimentation, and morphologic studies, including physical modeling and advanced capabilities in computational fluid dynamics (CFD).

McMillen Jacobs Associates
McMillen offers a full “design-procure-build-operate” package ensuring a seamless integration of the environmental, engineering, and construction team throughout a project’s execution. We provide consulting services to the water resource markets including dams, hydropower, and fisheries (hatchery and passage). McMillen is one of the few consulting firms offering the in-house capabilities in pre-design, engineering, environmental, self-perform construction, start-up, and operation. This model has been successful on projects for clients located throughout North and South America.

National Hydropower Association
NHA is a nonprofit national association dedicated to promoting the growth of clean, affordable hydropower. It seeks to secure hydropower’s place as a climate-friendly, renewable and reliable energy source that serves national environmental, energy, and economic policy objectives.

Natel Energy
Natel is committed to unlocking the potential for low head hydropower as a source of clean baseload power. Natel’s hydroEngine™ is a fully flooded, two-stage impulse hydropower turbine. The hydroEngine™ delivers high performance and low cost for large flow, low head sites. Machine design combines simple, easy-to-manufacture impulse blades with high efficiency. Natel has commercial units installed and is ready to support site-owner customers as well as fund/develop additional site.

Mersen
As a Global Expert in electrical specialties and graphite-based materials, Mersen manufactures carbon brushes, brush-holders and slip rings for motors and generators. Mersen’s Carbon Dust Collection Systems are unique for hydroelectric generators. The Carbon Dust Collection System integrates suction nozzles into the brush-holders in order to capture and contain carbon dust, resulting in less cleaning requirement and longer maintenance cycles.

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Max J. Kuney Company
As a fourth generation family-owned General Contractor, Max J. Kuney Company has been building the Northwest since 1930. In the hydro and marine market, Kuney has a growing resume of rehabilitation and new construction projects, utilizing traditional, alternative, and emergency delivery methods. We pride ourselves on self-performing a high percentage of our projects, with local project managers, superintendents and crews who will partner with you from start to finish.

Mavel Americas, Inc.
Mavel A.S., a premier global supplier of turbines for hydroelectric projects 30kW to 30MW, offers a full line of Pelton, Francis, Kaplan and micro turbines. In 2015, Mavel delivered four Kaplan PIT turbines to a 10MW project in Illinois and eight modular micro turbines to the Head of the U Hydroelectric Project on the North Side Canal system in Idaho. Activities in the Americas are handled through offices in Boston, Sacramento and Victoria, BC.

MacKay Sposito
You can’t define MacKay Sposito in one easy phrase. We are consultants in energy, land development, and public infrastructure. We’re an array of technical disciplines: civil engineering, construction management, surveying and landscape architecture. But we’re more than that. Our strength is in building relationships. That means we think of our clients as human beings, not projects. We provide a bridge between the public and private sectors. We open doors for our clients into communities.

Low Impact Hydropower Institute (LIHI)
The Low Impact Hydropower Institute (LIHI) is a non-profit 501(c)(3) organization dedicated to reducing the impacts of hydropower through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to the LIHI’s criteria. LIHI’s Certification Program ensures protection healthy ecosystems in rivers and enables low-impact projects to access renewable energy markets. LIHI has been in operation since 2000, certifying 170 projects and almost 5 GW across the U.S.

Kingsbury, Inc.
Dr. Albert Kingsbury invented the hydrodynamic thrust bearing in 1912. Since then, Kingsbury, Inc. has been the leader in the design and manufacture of tilt-pad fluid film thrust and journal bearings for all types of rotating machinery, with hundreds of installations worldwide. Over the years Kingsbury has committed itself to engineering bearing solutions to meet specific application challenges and to continuous bearing improvement through dedicated research and development efforts.

KamaticsRWG
Kamatics Corporation of Bloomfield, Connecticut and RWG Höchstadt, Germany, comprise the KAMAN Specialty Bearing and Engineered Products group. For decades, KamaticsRWG have been designing, testing, and manufacturing the highest performing bearings and operational critical parts in the industry, excelling under the most demanding conditions. KamaticsRWG products are trusted throughout the world in industries as varied as aerospace, military, rotorcraft, space, marine, factory automation, motorsports, hydro, heavy equipment, and oil & gas.

JHP and Associates, Inc.
JHP Hydro/Tianfa Tianfa provides our clients the opportunity to take full advantage of advanced turbine designs, superior world class manufacturing facilities as well as the most cost effective turbine/generator package. We pride ourselves to be fully capable of supplying most types of turbine/generator that North America market will ever need to ensure the highest ROI and lowest construction costs for your next hydro project. JHP Hydro, Your Gateway to the BEST Turbine and Generator Solution.

International Water Screens
IWS designs, manufactures and installs Traveling Water Screens and Fish Screens for fish protection and water borne debris removal.

Hydro Consulting & Maintenance Services, Inc.
HCMS has accumulated over 550 years of experience in the installation, repair and maintenance of hydroelectric turbines and generators. We provide services to utility companies and manufacturers of hydro turbines and generators. Our success is defined by our ability to bring value to projects by offering highly trained technical hydro experienced personnel. Hydro Consulting & Maintenance Services, Inc., is certified as a women’s business enterprise through the Women’s Business Enterprise National Council (WBENC).

Gilkes
Established in 1853, Gilkes is an international company having manufactured over 6,600 turbines with exports to over 87 countries. We offer complete water to wire solutions for hydroelectric developments ranging from 50kW to 20MW. With an office based in Tacoma, WA, we serve the North American hydro market directly, with services including design, manufacture, installation, commissioning, testing, routine service and plant upgrade.
GE
GE Service provides complete engineering and site services for the Hydropower industry with service centers located throughout North America. These centers are fully equipped with staff and tooling to provide rapid 24/7 response to emergency situations, perform routine maintenance and training, and to assist the client with specialized technical expertise. Available services include: Unit Condition Assessment, complete generator mechanical and electrical testing, comprehensive turbine repair, control & governor service, hydraulic systems, complete O&M Services.

Copperleaf Technologies
Copperleaf works with asset intensive organizations facing the challenges of aging infrastructure. We help our customers rethink the traditional approach to capital planning, asset lifecycle planning, and budgeting. Copperleaf’s approach is closely aligned with the ISO 55000 asset management standard. Our Asset Investment Planning and Management (AIPM) solutions help customers integrate planning, analysis, approval, and execution so that they can make risk-informed decisions that are effective, transparent, and focused on long-term performance. www.copperleaf.com

Fibrwrap Construction, Inc.
Structural Strengthening of Penstocks; Power Stations; and Bridges:
Most hydroelectric generating stations across North America are 50-100 years old and are approaching, or have exceeded, their design life. Owners are faced with a financial dilemma: Refurbish, Replace or Run to Failure. There is a structural rehabilitation alternative to concrete and steel - Fibrwrap® is an advanced carbon and glass fiber system that is; low weight, low profile, and has a design life of 50-100 years.

C.C.JENSEN
C.C.JENSEN designs and manufactures oil filtration and dehydration systems that purify all types of oils and lubricants at hydroelectric facilities. Why do we do what we do? Because we want your facility to run reliably and get maximum life from lubricants and equipment! Dramatically reduce downtime and slash O&M costs with C.C.JENSEN. We offer filter skids, portable filters and kidney-loop filters. Over 200 hydroelectric facilities have experienced the value of C.C.JENSEN. Visit us at www.ccjensen.com.

Eureka Software
Eureka Software is the information technology products and services company for the hydropower industry. Eureka has been involved in FERC relicensing of hydro projects representing over 20% of the national installed capacity. Eureka’s award-winning leading-edge products and services include public and private relicensing websites, FERC license application document publishing, and ES Compliance Tracker, Eureka’s compliance software for the hydropower industry. Our products and services support the licensing process from NOI to FLA and beyond.

Canyon Hydro
Canyon Hydro is a leading designer and manufacturer of Pelton and Francis turbines for private developers and utilities. Canyon provides complete water-to-wire packages and energy recovery systems, as well as repair and replacement of runners, wicket gates and other major components. With more than 37 years in the industry, Canyon’s reputation is for high efficiency, premium quality, and exceptional customer support. Canyon performs all design and manufacturing at our facilities in Washington State. www.canyonhydro.com

Emerson Process Management
Emerson Process Management provides control solutions for hydroelectric power plants for enhanced dispatch abilities, extended life, and improved reliability and availability. We help utilities meet the stringent operating requirements by maximizing power generation in a safe and secure manner, while meeting government standards. Emerson provides products, services and application knowledge. We provide solutions for: SCADA, Advance Control Strategies, Generator Turbine Control, Governor Control, Generator Exciter/AVR and Vibration Monitoring.

Bay Valve Service, LLC
Bay Valve Service, LLC is an Industrial Service Solutions company (www.ISS-NA.com). For nearly 30 years, customers in the mining, refining, pulp and paper, Power - Hydro - coal - gas, petrochemical, oil and gas and other industries in the western U.S. have relied on Bay Valve Service for valve installation, field service, valve repair, new products, and engineered flow solutions. Contact Bay Valve for Service and Product solutions in your plant.

Ballard Marine Construction
A leading provider of Marine Construction and Industrial Marine services to the Northwest since 1978. Ballard has a history of taking on, and successfully completing, technically demanding projects for government and private clients around the world. Our team responds to both planned and emergency projects.
Scholarship Honors Industry Colleague

Many of you worked with Julie over the years as a result of her leadership roles in both the Northwest Hydroelectric Association (NWHA) and the National Hydropower Association (NHA). In 2003 she was the recipient of the Henwood Lifetime Achievement Award, the hydropower industry's most prestigious individual achievement award for her industry contributions. More recently she has been the chair of the Low Impact Hydropower Institute (LIHI), continuing her support of hydropower development while achieving sound environmental practices. We want to continue her stellar work and with the support of her family NWHA has established the JULIE A. KEIL WOMEN IN HYDRO SCHOLARSHIP FUND.

Julie worked at Portland General Electric for over 25 years, where she managed the hydro licensing program. She had unfailing energy and commitment to ensuring that settlement negotiations reached a successful conclusion. She was a mentor to many and will long be remembered for her contributions to our industry.

NWHA has established the JULIE A. KEIL WOMEN IN HYDRO SCHOLARSHIP FUND at U.S. Bank. Julie’s family and NWHA are very supportive of developing an ongoing scholarship program for women who plan to enter our industry.

Many of the utilities and companies nationwide have been able to benefit from Julie’s leadership, her insight and her ability to work with agencies toward mutual goals. Your company can contribute to the scholarship fund and receive a tax credit as an additional benefit. The fund also accepts individual donations from industry members and associates.

You can honor Julie with a donation:

1) wire a donation to the US Bank scholarship account (NWHA can provide routing); or
2) mail a donation to NWHA at the address below and make the check out to Scholarship fund; or
3) leave a donation at the conference registration desk this week.

Northwest Hydroelectric Association
P.O. Box 2517
Clackamas, OR 97015
(503) 545-9420
(866) 329-6525 Fax
www.nwhydro.org
## NWHA Panels at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m.</td>
<td>Registration Opens / Continental Breakfast in Exhibit Area</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Opening Remarks</td>
</tr>
<tr>
<td>8:15 a.m.</td>
<td>Utility Roundtable: The Future of Our Hydro Resources</td>
</tr>
<tr>
<td>9:15 a.m.</td>
<td>Hydropower Innovation through the Project Lifecycle</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>Break in Exhibit Area</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>Managing Reservoirs for All</td>
</tr>
<tr>
<td>12:30 p.m.</td>
<td>Luncheon Session: NREL “RAPID” Toolkit Hydropower Initiative</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>Interspecies Conflicts: The Challenges of Managing Fish &amp; Wildlife Interactions at Hydroelectric Projects</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Break in Exhibit Area</td>
</tr>
<tr>
<td>3:35 p.m.</td>
<td>Habitat Mitigation—What Works</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>Adjourn / Social in the Exhibit Area</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Registration Opens / Continental Breakfast in Exhibit Area</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Welcome</td>
</tr>
<tr>
<td>8:15 a.m.</td>
<td>Transmission: How Hydro Moves</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>Energy Markets – The Evolving Role of Hydro</td>
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<tr>
<td>10:30 a.m.</td>
<td>Break in Exhibit Area</td>
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<tr>
<td>10:50 a.m.</td>
<td>Risky Business – Asset Management for Aging Hydro Plants</td>
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<tr>
<td>12:00 p.m.</td>
<td>Awards Luncheon / NWHA Annual Membership Meeting</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>Life at Mid-License: Cruisin’ or Crisis</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Break in Exhibit Area</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Working with Dam Owners Through “Our Eyes”</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>Adjourn / Social in the Exhibit Area</td>
</tr>
<tr>
<td>7:15 a.m.</td>
<td>Continental Breakfast in Exhibit Area</td>
</tr>
<tr>
<td>8:30 a.m.</td>
<td>Emerging Legal &amp; Regulatory Matters Impacting Northwest Hydro</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Break in Exhibit Area</td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Getting to Know Your FERC Staff</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Conference Adjourns</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>Pumped Storage Workshop</td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>Workshop Adjourns</td>
</tr>
</tbody>
</table>

All conference rooms are in the Lower Lobby. Throughout the conference, these rooms will be used for General Session: Salons F-I; Exhibit Area: Salons A-E and Lower Lobby; Registration: Lower Lobby.