



Hydropower Program Peer Review Agenda

July 25–29, 2022

Hydropower Program Opening Plenary

| DAY 1 MONDAY, JULY 25, 2022 | | | | |
|-----------------------------|----------|--|--------------|----------------------------------|
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:30 AM | WPTO Overview | WPTO | Jennifer Garson |
| 10:30 AM | 10:40 AM | Peer Review Introduction | WPTO | Ali Hewett |
| 10:40 AM | 10:45 AM | BREAK | | |
| 10:45 AM | 11:30 AM | Hydropower Program Overview | WPTO | Tim Welch |
| 11:30 AM | 11:55 AM | Data Access, Analytics, and Workforce Development Activity Area Overview | WPTO | Corey Vezina, Allison Johnson |
| 11:55 AM | 12:25 PM | Hydropower STEM and Workforce Development | NREL | Elise DeGeorge |
| 12:25 PM | | ADJOURN AND MOVE TO ACTIVITY AREA BREAKOUTS (Days 2–4) | | |

Activity Area Breakout Sessions

WPTO's Hydropower Program Activity Areas Color-Coded Key

| |
|---|
| Innovations for Low Impact Hydropower Growth |
| HydroWIRES |
| Fleet Modernization, Maintenance, and Cybersecurity |
| Environmental and Hydrologic Systems Science |

Innovations for Low-Impact Hydropower Growth Review Session

| DAY 2 TUESDAY, JULY 26, 2022 | | | | |
|--------------------------------|----------|--|--|--|
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:30 AM | Innovations for Low-Impact Hydropower Growth Activity Area Overview | WPTO | Katie Jackson |
| 10:30 AM | 11:00 AM | Groundbreaking Hydro and I AM Hydro Prizes | NREL, ORNL, WPTO | Tessa Greco, Scott DeNeale, Katie Jackson |
| 11:00 AM | 11:25 AM | The Design and Development of a Composite Hydropower Turbine Runner | Composite Technology Development, Inc. | Paul Fabian |
| 11:25 AM | 11:35 AM | BREAK | | |
| 11:35 AM | 11:50 AM | Cold Spray Process Development for In Situ Repair and Mitigation of Cavitation Erosion | PNNL | Chris Smith |
| 11:50 AM | 12:15 PM | Standard Modular Hydropower Technology Acceleration | ORNL | Scott DeNeale |
| 12:15 PM | 1:00 PM | LUNCH | | |
| 1:00 PM | 1:25 PM | Restoration Hydro: A Watershed Approach to Standard Modular New Hydropower | Natel Energy, Inc. | Abe Schneider |
| 1:25 PM | 1:50 PM | Prefabricated Standard Modular Hydropower Installations for Low-Cost Small Hydropower | Littoral Power Systems Inc | David Duquette |
| 1:50 PM | 2:15 PM | Small Hydro Interconnection Study | PNNL, ORNL | Alison Colotelo, Todd Wall, Chris O'Reilly, Hope Corsair |
| 2:15 PM | 2:40 PM | Reviewer Debrief | Reviewers | |
| DAY 3 WEDNESDAY, JULY 27, 2022 | | | | |
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:25 AM | Development of a Modular Helical Fish Passage for Low Head Applications | Percheron Power, LLC | Jerry Straalsund |
| 10:25 AM | 10:50 AM | Advanced Compact Generation Module with Fish Safe Runner Technology | Natel Energy, Inc. | Gregor Cadman |
| 10:50 AM | 11:15 AM | Prefabricated Zero Ascend Omnispecies (ZAO) Modular Fish Passage Modules | Littoral Power Systems Inc. | David Duquette |

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|----------|----------|---|--|--------------------------------|
| | | Using Advanced Manufacturing Techniques | | |
| 11:15 AM | 11:25 AM | BREAK | | |
| 11:25 AM | 11:50 AM | A Novel Sediment Passage Module Design for Support of Standard Modular Hydropower | Regents of The University of Minnesota | Jeffrey Marr |
| 11:50 AM | 12:15 PM | National Conduit Resource Assessment | ORNL | Shih-Chieh Kao |
| 12:15 PM | 1:00 PM | LUNCH | | |
| 1:00 PM | 1:25 PM | Integrated Water Power Resilience | PNNL, INL | Juliet Homer, Tim McJunkin |
| 1:25 PM | 1:50 PM | Irrigation Modernization | INL, PNNL | Thomas Mosier |
| 1:50 PM | 2:15 PM | Alternative Opportunities for Hydropower | PNNL, INL | Rajiv Prasad, Thomas Mosier |
| 2:15 PM | 2:40 PM | Cost Data Collection & Modeling for Hydropower | ORNL | Gbadebo Oladosu |
| 2:40 PM | 3:05 PM | Reviewer Debrief | Reviewers | |

HydroWIRES (Grid Reliability, Resilience, and Integration) Review Session

| DAY 2 TUESDAY, JULY 26, 2022 | | | | |
|--------------------------------|----------|---|---|------------------------------------|
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:40 AM | HydroWIRES Initiative Overview | WPTO | Sam Bockenbauer |
| 10:40 AM | 11:05 AM | Hydropower Flexibility Framework | Electric Power Research Institute, Inc. | Francisco Kuljevan |
| 11:05 AM | 11:30 AM | Increasing Operational Flexibility of Francis Turbines at Low Head Sites, Through Analytical and Empirical Solutions | GE Renewable Energy Hydro | Guillaume Rudelle |
| 11:30 AM | 11:40 AM | BREAK | | |
| 11:40 AM | 12:05 PM | Exploring Multidimensional Spatial-Temporal Hydropower Operational Flexibilities by Modeling and Optimizing Water-Constrained Cascading Hydroelectric | Stevens Institute of Technology | Lei Wu |
| 12:05 PM | 12:30 PM | Identifying Hydropower Operational Flexibilities in Presence of Streamflow and Net-Load Uncertainty | University of California, Irvine | Soroosh Sorooshian and Bitu Analui |
| 12:30 PM | 1:00 PM | LUNCH | | |
| 1:00 PM | 1:25 PM | Geomechanical Pumped Storage | Quidnet Energy Inc. | Joe Zhou |
| 1:25 PM | 1:50 PM | Modeling And Optimizing Pumped Storage in A Multi-Stage Large Scale Electricity Market Under Portfolio Evolution | University of Missouri System | Rui Bo |
| 1:50 PM | 2:15 PM | Value And Role of Pumped Storage Hydro Under High Variable Renewables | GE Power | Christina Bisceglia |
| 2:15 PM | 2:40 PM | Predicting Unique Market Pumped Storage Significance (PUMPSS) | Electric Power Research Institute, Inc. | Aidan Tuohy |
| 2:40 PM | 3:00 PM | Reviewer Debrief | Reviewers | |
| DAY 3 WEDNESDAY, JULY 27, 2022 | | | | |
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |

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| 10:00 AM | 10:30 AM | FAST Commissioning Prize for Pumped Storage Hydropower | NREL, WPTO | Tessa Greco, Corey Vezina |
| 10:30 AM | 10:55 AM | PSH-TES Tool | PNNL, ANL | Mark Weimar, Patrick Balducci |
| 10:55 AM | 11:20 AM | HydroWIRES Topic D1: CEM Enhancements | NREL | Stuart Cohen |
| 11:20 AM | 11:30 AM | BREAK | | |
| 11:30 AM | 11:55 AM | Value Drivers Quantification | ANL, NREL, PNNL | Todd Levin |
| 11:55 AM | 12:20 PM | HydroWIRES Topic A: Environment-Flexibility Win-Wins | ORNL | Brenda Pracheil |
| 12:20 PM | 1:00 PM | LUNCH | | |
| 1:00 PM | 1:25 PM | PSH Portfolio Evaluation and Innovation Study | ANL | Vladimir Koritarov |
| 1:25 PM | 1:50 PM | Life Cycle Assessment of Storage Technologies | NREL | Greg Stark |
| 1:50 PM | 2:15 PM | Scope Improvements to Power Flow and Stability Models | PNNL | Slaven Kincic |
| 2:15 PM | 2:30 PM | Reviewer Debrief | Reviewers | |

DAY 4 THURSDAY, JULY 28, 2022

| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
|------------|----------|--|----------------------------|--------------------------------|
| 10:00 AM | 10:25 AM | HydroWIRES Topic C: Quantifying Reliability/Resilience | PNNL, ANL, INL, NREL, ORNL | Abhishek Somani |
| 10:25 AM | 10:50 AM | HydroWIRES Topic D2: Transmission/Storage Equivalence | PNNL, ANL | Jeremy Twitchell, Zhi Zhou |
| 10:50 AM | 11:15 AM | Idaho Power Run-of-River Hydropower and Battery Modeling | PNNL | Feng Pan |
| 11:15 AM | 11:25 AM | BREAK | | |
| 11:25 AM | 11:50 AM | Hydropower Plant Controller Prototyping using Remote Hardware in the Loop | NREL | Mayank Panwar |
| 11:50 AM | 12:15 PM | Integrated Hydropower and Energy Storage: Providing Essential Reliability and Ancillary Services using Individual or Coordinated Hydropower Plants | INL, NREL | Thomas Mosier, Vahan Gevorgian |
| 12:15 PM | 1:00 PM | LUNCH | | |
| 1:00 PM | 1:25 PM | Hydropower Storage Capacity Dataset | ORNL | Carly Hansen |
| 1:25 PM | 1:50 PM | HydroWIRES Topic B1: Enhancing the Representation of Conventional | NREL, PNNL | Greg Stark, Nathalie Voisin |

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| | | Hydropower Flexibility in Production Cost Models | | |
| 1:50 PM | 2:15 PM | HydroWIRES Topic B2: Improving the Representation of Hydrologic Processes and Reservoir Operations in Production Cost Models | NREL, PNNL | Greg Stark, Nathalie Voisin |
| 2:15 PM | 2:40 PM | HydroWIRES Topic D3: Forecasting | PNNL, INL | Nathalie Voisin, Thomas Mosier |
| 2:40 PM | 3:00 PM | Reviewer Debrief | Reviewers | |

Fleet Modernization, Maintenance, and Cybersecurity Review Session

| DAY 4 THURSDAY, JULY 28, 2022 | | | | |
|-------------------------------|----------|--|------------------|------------------------|
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:25 AM | Fleet Modernization, Maintenance, and Cybersecurity Activity Area Overview | WPTO | Kyle DeSomber |
| 10:25 AM | 10:50 AM | Digital Twin | PNNL, ORNL | Osman Ahmed, Hong Wang |
| 10:50 AM | 11:15 AM | Hydropower Fleet Intelligence | ORNL | Pradeep Ramuhalli |
| 11:15 AM | 11:25 AM | BREAK | | |
| 11:25 AM | 11:50 AM | Cybersecurity Value-at-Risk Framework | NREL, ANL | Anuj Sanghvi |
| 11:50 AM | 12:15 PM | Hydropower Cyber-Physical Reference Framework | PNNL, ANL, NREL | Ken Ham |
| 12:15 PM | 1:00 PM | LUNCH | | |
| 1:00 PM | 1:25 PM | Hydropower Cybersecurity Risk/State of Fleet | PNNL | Marie Whyatt |
| 1:25 PM | 1:50 PM | Hydropower Fleet Cybersecurity Response and Recovery | PNNL | Darlene Thorsen |
| 1:50 PM | 2:15 PM | Reviewer Debrief | Reviewers | |

Environmental and Hydrologic Systems Science

| DAY 2 TUESDAY, JULY 26, 2022 | | | | |
|--------------------------------|----------|--|------------------|----------------------------|
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:30 AM | Environmental and Hydrologic Systems Science Activity Area Overview | WPTO | Dana McCoskey |
| 10:30 AM | 10:55 AM | A Real-time and Autonomous Water Quality Monitoring System | PNNL | Daniel Deng |
| 10:55 AM | 11:20 AM | Shad Tag Development | PNNL | Daniel Deng |
| 11:20 AM | 11:30 AM | BREAK | | |
| 11:30 AM | 12:00 PM | Fish Protection Prize | NREL, WPTO | Tessa Greco, Dana McCoskey |
| 12:00 PM | 12:25 PM | Reviewer Debrief | Reviewers | |
| DAY 3 WEDNESDAY, JULY 27, 2022 | | | | |
| Start (ET) | End (ET) | Presentation Topic | Organization | Speaker |
| 10:00 AM | 10:25 AM | Demonstrating Value of River Data Aggregation and Visualization Capabilities | PNNL | Kyle Larson |
| 10:25 AM | 10:50 AM | GMLC Water Risk for the Bulk Power System: Asset to Grid Impacts | NREL, ORNL | Ariel Miara |
| 10:50 AM | 11:15 AM | Methane Emissions | ORNL | Natalie Griffiths |
| 11:15 AM | 11:25 AM | BREAK | | |
| 11:25 AM | 11:50 AM | FERC eLibrary | PNNL | Bo Saulsbury |
| 11:50 AM | 12:15 PM | Hydro Fleet Database Development and Analyses (HydroSource) | ORNL | Debjani Singh |
| 12:15 PM | 12:35 PM | Reviewer Debrief | Reviewers | |

Reviewer Debrief with WPTO *closed door*

| DAY 5 FRIDAY, JULY 29, 2022 | | | |
|-----------------------------|----------|--|--------------------|
| Start (ET) | End (ET) | Presentation Topic | Organization |
| 10:00 AM | 11:00 AM | HydroWIRES Reviewer Debrief with WPTO | Reviewers and WPTO |
| 11:00 AM | 11:45 AM | Environmental and Hydrologic Systems Science Reviewer Debrief with WPTO | Reviewers and WPTO |
| 11:45 AM | 12:15 PM | STEM and Workforce Development | Reviewers and WPTO |
| 12:15 PM | 1:00 PM | BREAK | |
| 1:00 PM | 2:00 PM | Innovations for Low-impact Hydropower Growth Reviewer Debrief with WPTO | Reviewers and WPTO |
| 2:00 PM | 2:30 PM | Fleet Modernization, Maintenance, and Cybersecurity Reviewer Debrief with WPTO | Reviewers and WPTO |