

ANNUAL COMMITTEE REPORT

Committee Name: Hydraulics & Hydrology

Submitted by: Greg Paxson, Keil Neff, Miles Yaw

Report Date: 2 April 2022

Committee Mission/Purpose

The USSD Hydraulics and Hydrology Committee supports and promotes advancement of the technical practices of hydrology and hydraulics as they relate to the evaluation of dams, spillways, and appurtenant structures. This includes (1) flood analyses including design hydrology and flood flow frequency estimation; (2) hydraulic design of spillways, outlet works, and other hydraulic structures related to multi-purpose project operation; (3) analyses of floods resulting from dam failures and assessment of potential downstream consequences; (4) hydraulic and hydrologic aspects of operation and maintenance, and (5) reservoir sedimentation and sustainability.

Chair: Greg S. Paxson, PE, D.WRE
Vice Chair: Keil J. Neff, PE, PhD
Vice Chair: Miles Yaw, PE (Young Professional)

To assist in carrying out its work, the Hydraulics and Hydrology Committee has established subcommittees. As of 2020, the committee has the following four active subcommittees: (1) Sedimentation Subcommittee (Marty Teal, chair), (2) Spillways Subcommittee (Brian Crookston, chair), (3) Hydrology Subcommittee (Jenn Gagnon, chair), and (4) Gates and Valves Subcommittee (Kevin Gerst, chair).

The Committee membership includes professionals from government or private organizations that own and operate dams, government organizations that regulate dams, consulting engineers that provide engineering services to dam owners, and members of academia involved in research related to hydraulics and hydrology. The Committee discusses technical issues, develops guidelines and publications, presents workshops, and generally promotes the advancement of state-of-the-practice for hydrologic and hydraulic analysis related to dams through the diverse backgrounds, experiences, and perspectives of the Committee membership.

2021 Goals/Accomplishments

- (1) Three committee meetings were held since the 2021 annual meeting (9 May 2021): (i) 29 September 2021 and (ii) 12 January 2022.
- (2) Committee Charter was updated, sent to the board, and approved (August 2021).
- (3) Nineteen (19) new members joined the committee since the last annual conference! This includes: (i) John Cox, (ii) Steven Emerman, (iii) James Everett, (iv) Melissa Foster, (v) Patrick Galaska, (vi) Eric Holmstead, (vii) Priyanka Jain, (viii) Nathan Jorgensen, (ix) Patrick Miles, (x) Dustin Mortensen, (xi) Tim Paulus, (xii) Jesse Pope, (xiii) Kerri Price, (xiv) Paul Risher, (xv) Mayank Tanwar, (xvi) Emilie Tarouilly, (xvii) Eric Toth, (xviii) Jason Miles, and (xix) Yaw Zhou.
- (4) Gates and Valves committee was reestablished and became active again under the leadership of Kevin Gerst. The subcommittee held several virtual meetings.
- (5) Miles Yaw replaced Jenn Gagnon as the Young Professional Vice Chair.

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- (6) Jenn Gagnon replaced Keil Neff as Hydrology Subcommittee chair. The subcommittee held one virtual meeting.
- (7) Two new ICOLD representatives were selected and approved for (i) Committee K (Integrated Operation of Hydropower Stations and Reservoirs) – James Everett, and (ii) Committee V (Hydromechanical Equipment – Tim Paulus.
- (8) As part of the 2021 Fall Workshop Series, three H&H workshops were prepared and delivered. This included (i) *Probabilistic Flood Hazard Analysis* presented by Dave Margo, Keil Neff, and Haden Smith (October 26-27), (ii) *Reviewing HEC-RAS 2-D Models: Pretty Colorful Animations are Not Always Accurate* presented by Brandon Hilbrich, Mark Forest, and Sara Davis, and (iii) *Reservoir Sedimentation and Sustainable Management* presented by George Annandale, Gregory Morris, Paul Boyd, and Tim Randle.
- (9) The Committee solicited interest in supporting the proposed Best Practices in Dam and Levee Safety Risk Analysis training. Resumes for four individuals interested in serving as trainers were submitted to the Risk Training subcommittee of the Education and Training Committee.

2022 Goals

- (1) The committee will continue to support the Education and Training Committee with webinars and other training needs.
- (2) Complete white paper on “Spillway Capacity Upgrades and Alternatives Selection” led by David Woodward, Brian Crookston, and Greg Paxson. Outline has been developed along with selected sections of text. We hope to advance this to be ready for Peer Review in Fall 2022.
- (3) Advance white paper on “Hydraulic Modeling of Spillways and Appurtenant Structures” led by Brian Crookston, Benjamin Israel Devadason, Dana Moses, and Tony Wahl. A draft has been completed with some missing sections. The contributors hope to meet during the April 2022 conference to discuss next steps. The goal is to have the white paper ready for peer review by end of 2022.
- (4) Gates and Valves subcommittee is planning to advance one or two white paper concepts: 1) Seismic criteria for hydraulic steel structures 2) steel deterioration modeling and inspection/maintenance optimization.
- (5) Members of the committee are supporting several ICOLD Committees: 1) Committee C – Hydraulics for Dams is working on a Bulletin entitled “Hydraulic and Structural Design of Chute Spillways and Uprating of Spillways – Recent Developments” 2) Committee S – Dams and Floods is starting a new Bulletin with chapters on Extreme Flood Estimation, Flood Risk Assessment, and Uncertainty 3) Committee J – Sedimentation of Reservoirs is working next on Terms of Reference
- (6) Discuss Workshop ideas during April meeting with a focus on supporting USSD with the Fall 2022 Workshops

What do you need to accomplish your 2022 goals?

The Committee will work with USSD to identify Peer Review Committees for proposed white papers.