

# Peer Review of Research Priorities Roadmap to Mechanical Hydropower Power and Energy Roadmap

**Date:** August 7, 2018

**Originating Office:** Research and Development Office, Bureau of Reclamation, Mail Code 08-10000, PO Box 25007, Denver CO 80225

## **Reclamation Roles:**

Director or Delegated Manager: Levi Brekke, Chief, Research and Development Office, Bureau of Reclamation

Peer Review Lead: Erin Foraker, Water Infrastructure and Power and Energy Research Coordinator, Bureau of Reclamation

**Subject and Purpose:** Reclamation's Research and Development Office recently engaged in hydropower research roadmapping to determine where future research efforts should focus to provide the greatest benefit. The purpose of the prioritized roadmap is to fill gaps in Reclamation's current toolbox to reduce outage time, extend the useful life of equipment, and increase hydropower generation for hydropower facilities. Reclamation field and Denver Office personnel generated the data used in this roadmapping process. A team of subject matter experts completed the roadmap and prioritized the identified research needs. The mechanical hydropower research roadmap describes the research need by identifying adverse outcomes, causes, current mitigation practices, and outstanding needs for tools, technology, etc.

The purpose of this Peer Review Plan is to facilitate stakeholder and expert review of the roadmap for use in future decision processes amongst Reclamation leadership. The report (roadmap) will also be distributed to the roadmap data respondents as an internal vetting exercise.

**Impact of Dissemination:** The Mechanical Hydropower Research Roadmap report is not determined to be influential or highly influential as defined by the Reclamation Manual Peer Review of Scientific Information and Assessments (CMP P14) implementing Office of Management and Budget Final Information Quality Bulletin for Peer Review (70 FR 2664-2677).

**Peer Review Scope:** This peer review is focused solely on the research needs identified in the Mechanical Hydropower Research Roadmap and their ranked priority. Peer reviewers are asked to provide responses relative to the questions below:

Question 1. Based on your experience, is the final list of highest priority research needs representative of the greatest mechanical hydropower needs?

Question 2. Describe your experiences related to the research needs identified within this report, if any.

Question 3. Are there other important research needs associated with this topic that were not identified in this report?

**Manner of Review, Selection of Reviewers:** Expert and stakeholder review will occur concurrently through targeted invitations from Reclamation. Professional and scientific societies dedicated to the engineering or operations of pipelines and associated structures will be asked to nominate potential peer reviewers. The expert peer reviewers will have least 10 years of experience with hydropower, including penstocks, turbines, fields as pipeline design, pipeline construction, and pipeline operation. Reviewers will be given attribution for their comments and not remain anonymous.

**Number of Peer Reviewers:** It is anticipated that more than 10 peer reviewers will be utilized.

**Timing of review:** August 20, 2018 to September 10, 2018

**Delivery of findings:** Following the review period, the Peer Review Lead will consolidate and synthesize the input from individual peer reviewers. At a minimum, this peer review summary document will include a description of the peer review process, subject being reviewed, and reviewer comments. The final roadmapping report will be provided digitally and as a hardcopy to Reclamation Research Office.

**Applicability of Federal Advisory Committee Act (FACA):** This peer review is not subject to the Federal Advisory Committee Act (FACA) because reviewers are being asked to provide individual reviews on the subject matter. Reclamation is not seeking consensus advice from the reviewers as a group.

**Agency contact:** Erin Foraker, Reclamation's Water Infrastructure and Power and Energy Coordinator ([eforaker@usbr.gov](mailto:eforaker@usbr.gov)).

**Comment Disposition Table**

#	Reviewer, Org	Comment	Resolution
1	Tom Spicher, Hydro Y.E.S.	<p><i>Email comments:</i></p> <p>A) The roadmap does not address in-house vs. contract operation and maintenance.</p> <p>B) FEA analysis should be used with care regarding choice of runner material, item 12.</p> <p>C) More specific discussion is needed to avoid “low-bid” replacement material that may not be compatible.</p>	<p>A) The scope of this roadmap is to identify research needs to address technical issues with mechanical equipment and components. Issues related to in-house vs. contracted O&amp;M activities were brought up in our survey results. They are recognized on pg 7 of the report and specific comments are included in the “O&amp;M or Program Needs” column of the roadmap table.</p> <p>B) FEA mentioned in Item 12 (O&amp;M or Program Needs) refers to a broad technical need to inform decisions for repairs or replacement. Reclamation guidelines are already in place regarding material design for turbine runners. Generally, FEA is used in all designs from the manufacturer. The material currently specified is a combination of design criteria, operations, and repair needs.</p> <p>C) This is covered in Research Need b) of Item 8 in the roadmap.</p>
2	Stanislav Pejovic and Aleksandar Gajic, Consultant	<p><i>Email comments:</i></p> <p>A) “Reviewing the available documents we noticed that there is no R&amp;D on subject that is the source of more than 50% troubles and accidents in hydroelectric plants. Today 99% of electricity storage is in water reservoirs of storage and pumped storage plants. Unmanageable sources (wind, solar, etc.) will increase the number of troubles and accidents! We could discuss the issue.”</p>	<p>A) This roadmap is specifically addresses mechanical equipment and components of hydroelectric facilities and is meant to address technical needs and provide applied research opportunities. It is unclear if the comment is addressing mechanical equipment. Hydropower incidents and accidents are addressed in our O&amp;M Programs, such as unexpected events, which are designed toward identifying any specific patterns or repeated events within mechanical and electrical equipment at hydropower facilities.</p>