Risk Retirement Workshop Report

Ocean Renewable Energy Conference (OREC)
September 11, 2019, 8:00-10:00am
Portland, Oregon

Background

The Risk Retirement Workshop built on previous and ongoing efforts to examine pathways for determining data needs, monitoring requirements, and possible mitigation measures to ensure that risks due to underwater noise can be considered "retired" for permitting small installations (single devices and small arrays) of tidal turbines and wave energy converters (WECs).

The workshop brought together researchers, regulators, developers, and consultants to reach consensus on the remaining state of uncertainty around underwater noise risks, to identify key gaps in knowledge to be filled by further research and monitoring, and to identify a clear pathway for retiring risks for underwater noise in arrays, as well as for other interactions perceived to cause risk to marine animals and habitats.

Sixty members of the marine renewable energy (MRE) community from 3 different countries participated in the workshop (see Appendix B for attendee list). The OES-Environmental team presented the risk retirement pathway, the current state of knowledge regarding underwater noise risks, and two hypothetical examples to demonstrate application of the risk retirement pathway. Following the presentation, workshop participants split into three breakout groups (two wave groups, one tidal group) to examine the risk retirement pathway with the help of well-defined case studies, existing data sets, and the tools developed under OES-Environmental. The workshop was concluded by a report out of each group's discussion (see Appendix A for workshop agenda).

Discussion

- Tidal Energy Breakout
    - Participants initially expressed varying opinions regarding underwater noise's readiness for risk retirement. Some participants said the risk is ready to be retired, some said we need more standardization, and some expressed interest in accelerated deployment.
    - Participants agreed that deploying a single tidal device would probably not be an issue but that they would like to understand the sound spectrum of different species better.
    - Participants expressed interest in developing strategic guidelines for how far to place a hydrophone away from a tidal device as part of an adaptive management plan.
    - Participants expressed interest in exploring alternative materials that may produce less underwater noise.

- Participants questioned whether involved parties would be interested in knowing the acoustic output of tidal devices alone, or if that of chains and moorings would be determined as well.
- Participants recommended that the Department of Energy and the Bureau of Ocean Energy Management fund more acoustic baseline research.
- Participants agreed that sound spectrum data from a single device would likely be enough to allow for the deployment of more devices (if that data is modelled and verified following deployment), but more information would be needed before deploying many devices.
- Participants expressed the need for all regulators and developers to know about Data Transferability and the Monitoring Datasets Discoverability Matrix.
- Overall, participants agreed that the risk can be retired but that more research is needed, which will require accelerated deployment of devices.

- Wave Energy Breakouts
  - Participants discussed PacWave and their plans for underwater noise monitoring and mitigation, highlighting that test centers could provide a good way for developers to understand the noise of their devices and to contribute to industry understanding.
  - Participants highlighted the role of adaptive management, noting that when regulators get more information over time and build trust, relationships improve and monitoring requirements may get reduced.
  - Participants noted that monitoring should be proportional to threat, especially as monitoring everything is extremely cost prohibitive and that the MRE industry is not the same as the oil and gas industry.
  - Participants expressed concerns regarding the noise levels emitted from functioning vs. malfunctioning WECs and how to best measure (must include frequency) and monitor these.
  - Participants expressed concerns regarding where to measure the noise levels emitted from WECs and how to determine how far specific noises can travel (and whether those noises could enter areas of biological importance, such as feeding grounds and migration corridors, or whether those noises could serve as an obstacle/barrier).
  - Participants discussed the work done in Hawaii with NAVPAC on how noise may impact sessile animals and how this is unlikely to be an issue. However, there are concerns regarding the impact of pressure waves, the impact of noise of coral recruitment (as they orient towards things that sound like reefs), and the impact of decommissioning and removing) man-made structures once colonized (would this be considered essential fish habitat). Federal partners expressed interest in identifying the parts of the spectrum that are critical for coral recruitment and modifying WECs accordingly.
  - Participants discussed the National Marine Fisheries Services' (NMFS) prior use of acoustic monitoring for dynamic positioning vessels and how NMFS no longer requires this as animals would have to be very close to the vessel to be impacted, which was highlighted as an example of a risk being retired.
  - Participants discussed how to address the potential deployment of WECs in areas with other industries whose noisy operations have been grandfathered in. OpenHydro's deployment at the European Marine Energy Center's test center was discussed as an

example in which the noise of shipping clearly outweighed that of the device, so additional monitoring was not needed.
- – Participants expressed concerns that thresholds have only been developed for harm and not for behavioral changes.
- – Participants agreed that it does not seem right/fair that the MRE industry is being held to higher standards than other industries (e.g., offshore oil and gas).
- – Overall, participants agreed that underwater noise is close to retirement for devices that remain under thresholds, but we need to understand how animals use an area.
- Participant Feedback from Exit Surveys
    - – Participants found the workshop materials provided ahead of time useful.
    - – Participants found the Risk Retirement Pathway intuitive and easy to navigate.
    - – Several participants expressed concerns regarding how regulators and developers will accept the risk retirement process, the need for more test data to fully implement it, and how long the risk retirement process would take.
    - – Participants expressed interest in the following topics for OES-Environmental to focus on in the future:
        - ▪ Positive environmental effects from MRE deployments;
        - ▪ Streamlined information sharing;
        - ▪ Environmental monitoring guidelines/thresholds for non-acoustic impacts;
        - ▪ Animals' behavioral changes as more devices are deployed;
        - ▪ Standard test facility monitoring; and
        - ▪ Impacts of footprints on the seafloor.

Next Steps
- Continue to work with US regulators.
- Continue to develop the data transferability and risk retirement processes.
- Draft framework for application of risk retirement.
- Develop guidance documents.

Appendices
- Appendix A: Workshop Agenda
- Appendix B: Workshop Attendees
- Appendix C: Workshop Feedback Survey Questions

Appendix A: Workshop Agenda

- **8:00 – 8:15** Introduction and presentation of the Risk Retirement Pathway
- **8:15 – 8:25** Presentation on current knowledge of underwater noise risks
- **8:25 – 8:35** Instructions for the breakout sessions
- **8:35 – 9:30** Breakout sessions that will address:
  - Tidal turbine hypothetical example
  - Wave converter hypothetical example
- **9:30 – 9:50** Report out
- **9:50 – 10:00** Summarize and wrap-up
- **10:00** Adjourn

Appendix B: Workshop Attendees

Attendee	Organization	Country
Andrea Copping	PNNL	US
Lenaig Hemery	PNNL	US
Mikaela Freeman	PNNL	US
Lysel Garavelli	PNNL	US
Jonathan Whiting	PNNL	US
Hayley Farr	PNNL	US
Dori Overhus	PNNL	US
Debbie Rose	PNNL	US
Levy Tugade	PNNL	US
Bart Lindberg	OIT College Student	US
Tim Ramsey	DOE	US
Lauren Moraski	DOE	US
Kathryn White	Ecology & Environment	US
Annie Lilje	DOE (Sandia)	US
Cassie Riel	APL-UW	US
Nick Tealer	ODLCD	US
Walter Schurtenberger	Hydrokinetic Energy Corp	US
Arnie Fontaine	ARL - Penn State University	US
John Schaad	BPA	US
Michael Ondusko	C Power	US
Dale Beasley	CRCFA	US
James Joslin	APL-UW	US
Shona Hirsch	UW	US
Alan Suwa	NAVFAC PAC	US
Devan Kawakami-Wong	NAVFAC PAC	US
Michelle Fogarty	NREL	US
Emily Browning	UAF	US
Hannah Ross	UW	US
Bruce Hesson	BSEE-POCSR	US
Simon Gore	DOE	US
Baxter Bond	UAF-ACEP	US
Benjamin Drajeske	UW	US
Jason Gerdes	US EPA	US
Rob Flynn	EMEC	UK
Chris Delange	Oregon Institute of Technology	US
James Salmon	BSEE	US
Blake Helm	ODSL	US
Shamus Gamache	CLPUD	US
Jesse Roberts	SWL	US
Austin Berrier	OSU	US

Yana Shininger	DOE	US
Scott James	Baylor University	US
Bert Uyenco	Dept. of Defense	US
Sean Hanser	Dept. of Defense	US
Phil Swan	AquaKing Energy	US
Andy Lanier	DLCD	US
Julia Anderson	Humboldt State University	US
Dan Hellin	Pacwave	US
Patty Snow	Oregon Coast Management Program	US
Jason Busch	POET	US
George Bonner	NC State	US
Jay Huggins	MHKDR	US
David Greene	NREL	US
Stefan Siegel	Atargis	US
Craig Jones	Integral	US
Milze Mitchell	BSEE	US
Aisha McKee	C Power	US
Ryan Nicow	DSA	Canada
Ama Hartman	UW	US
Nick Edwards	SOORC	US

Appendix C: Workshop Feedback Survey Question

1. Which hypothetical example did you work with today? What particularly interested you?
2. Was the material provided ahead of time useful, up-to-date, and informative? Which parts of the material were most interesting?
3. Was the Risk Retirement Pathway intuitive and easy to navigate? If not, what challenges did you experience?
4. Were there any important studies missing from what was presented? If so, please list them and provide links if possible.
5. Are there any other topics you would like to see OES-Environmental focus on?