



Environmental Effects and Risk Retirement Workshop Report

December 4, 2019, 10:00am–15:30pm
Sydney, Australia

Background

The Environmental Effects and Risk Retirement Workshop provided an overview of the state of the science on environmental effects of marine renewable energy (MRE) and discussed risk retirement and data transferability. The 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 electromagnetic fields (EMF) and underwater noise can be considered “retired” for permitting small installations (single devices and small arrays) of tidal turbines and wave energy converters.

The workshop served as an initial engagement opportunity with the MRE community in Australia. As this was an early exposure for most of the participants with OES-Environmental, emphasis was placed on bringing the group up to date on the state of the science of environmental effects of MRE, as well as examining and receiving input on risk retirement and other supporting work carried out by OES-Environmental over the past few years.

The workshop brought together researchers, regulators, developers, and consultants to reach consensus on the remaining state of uncertainty around EMF and 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 EMF and underwater noise in arrays, as well as for other interactions perceived to cause risk to animals and habitats.

Sixteen members of the MRE community from 4 different countries participated in the workshop (see Appendix A for attendee list). At the start of the workshop, OES-Environmental and ORJIP staff facilitated a discussion among the participants to understand their level of familiarity and knowledge around consenting MRE projects in Australia, challenges for the MRE industry in Australia, and to determine where the areas of greatest interest and knowledge might be as the workshop proceeded.

The OES-Environmental team presented an overview of the OES-Environmental tasks and a summary of the state of the science on environmental effects of MRE. Presentations on the risk retirement pathway and data transferability process, as well as the current state of knowledge of EMF and underwater noise risks followed. The workshop focused on discussions around two hypothetical examples of MRE developments to demonstrate application of the risk retirement pathway for EMF and underwater noise. OES-Environmental staff prepared the hypothetical example for MRE developments in cooperation with our Australian hosts to ensure that the locations, physical and biological parameters,

and likely MRE devices would suit the Australian waters. Following the presentation, the group engaged in discussion of the evidence available for risk retirement for EMF and underwater noise in the form of datasets and research studies. The workshop concluded with a recap of the day's discussion (see Appendix B for workshop agenda).

An online survey was sent to the participants immediately after the workshop to gauge their interest and engagement with the workshop material (see Appendix C for survey questions).

Discussion

The major discussion points are captured here:

Consenting Challenges in Australia

- Consultants (BMT) who carried out consenting for two Carnegie projects shared their experience
 - Main issues were impacts to marine fauna (especially entanglement of large marine fauna), EMF, habitat footprint, and potential oil leaks if a unit broke. The federal agency worried about entanglement, but once saw the devices they weren't concerned. Grey areas were EMF and underwater noise.
 - Stakeholder engagement was a major focus and included facilitated stakeholder sessions, how project would be managed, and worked towards "acceptance."
 - Open discussion with regulators who provided comments and feedback based on concerns – Carnegie provided an EIA and monitoring and management plans that were implemented to move forward. Strong emphasis on early stakeholder engagement as a success factor.
 - Carnegie didn't have to do baseline monitoring because a good knowledge base exists for the area and regulators were more concerned with managing the risks. Also didn't have to complete much post-decommissioning monitoring.
- Mako Tidal provided their experience, which was quite different and challenging
 - Turbine attaches to existing infrastructure so consenting was the responsibility of the Port who didn't know what to expect and regulators didn't know how to guide the process. Mako had to design a consenting process acceptable to regulators of the Port (who are not the usual regulators for ocean energy). Device was authorized for 6 months and deployed.
 - Environmental concerns were with dugongs and fish.
 - Highly contentious location (investigated by government because of a big fish die-off) with intense community and industry perspectives.
 - Lessons learned: no baseline for comparison for regulators to make decisions on – tried to use *Tethys*, but Australian regulators thought conditions were too different to compare; challenge around designing environmental monitoring system and gap of knowing what would be useful for future decision-making.
- Other relevant experiences/comments
 - From LNG work in Australia, if a regulator was consenting something they hadn't seen before/didn't know how to regulate/didn't know impacts, they would actively try to find other locations around the world to aid understanding – acknowledge that there may be differences, but still useful.

- Current problems with consenting Australia's first offshore wind farm (4 GW) because regulators have nothing to draw from and don't know what to do.
- Participants noted that the MRE industry should look at other sectors that may be similar and want to cooperate for consenting. In Australia it is not clear under which government agencies MRE may fall in different state jurisdictions. There are laws for ocean activities, but these differ between the states, which complicates consenting.
- There is a structured framework for consenting in Western Australia with specific factors to assess and a process with technical guidance (state Environment Protection and Biodiversity Conservation Act (EPBCA)) which will apply to MRE, but the specifics are new to the regulatory bodies.
- Some participants think Australia regulators are risk adverse but this is dependent on the regulator and mindset of the individual.
- Participants thought it is important for the MRE industry to develop a strategic context and imperative within which consenting could occur more easily.

State of the Science Discussion

- Challenge for MRE is finding the right project location without environmental impacts that are also in good location for other factors. Marine spatial planning has been used in the state of Victoria to take this into account. Participants notes that the MRE industry has to be a part of any MSP process and need to make sure any area assigned to MRE is economically/commercially viable.
- Participants noted it is important to consider the interaction with the foreshore (human and social/cultural elements) and community knowledge/experience should be noted. There was a project in another industry where community confidence was eroded and caused quite a problem. Commercial and recreation fishers in Australia are tough on other uses (all about access and compensation). In Australia there is a need to consider aboriginal rights to fish.
- Participants noted that the MRE community can learn from areas where artificial reefs are restoring an area and becoming a potential offset (offsetting has come up recently in EPBCA review).

Risk Retirement and Data Transferability

- There was a previous Australian project that failed but had some good lessons to learn for OES-Environmental risk retirement work.
- Participants thought risk retirement fits well in an Australian context and is a sound process that aligns with other similar processes.
- Participants also thought that risk retirement would depend on overall regulatory management acceptance of the process (or if they haven't seen it before) and who the regulators are (inconsistencies across individual regulators).
- Participants saw lots of value in the data transferability process and believed it to be helpful as a systematic analysis that regulators can use.
 - With certification of vessels, there was no difference between methods to certify a vessel from different countries, but there was a clear preference from the regulators for which country information was suitable. And the situation might be similar for work coming from international bodies like OES-Environmental (as in – positive). There is a

need for policy-makers and regulators to set up guidance/standards for data collection with specific methods to allow for transfer.

- Participants thought that if regulators are concerned about transferring data to different environments, an MRE project could commit to one round of monitoring to verify data, which would still lessen the overall consenting and monitoring burden.
- Challenge in Australia is there really aren't baseline data outside of some fisheries data, so developers are likely to be required to collect baseline data.

Risk Retirement Sessions

Underwater Noise

- Participants thought that risk from noise seems to be sorted and that thresholds (such as those in regulation in the US) seems logical, but that other stressors with no thresholds will be more difficult.
- Participants did note that even for stressors without regulatory limits and benchmarks, the risk retirement process is really great and gives a systematic way to think about issues.
- Participants thought that individual regulators will need some form of certainty and it is important to think about how much monitoring is needed to be certain or how much uncertainty will be accepted.
 - Adaptive management is one path forward – which should be OK in Australia because it is already a fundamental approach but may depend on the associated risk (if risk is too great, there may be no appetite for adaptive management). In fisheries all regulations use adaptive management, but if there is a public backlash there will need to be a full EIA prepared.
- Participants noted that cumulative effects may be an issue that arises. There are at least 4 projects that are being asked to figure out methods for cumulative effects
 - Messaging in the offshore sector is that whoever was in first is now the “existing environment” and whatever industry comes after is stuck with the consequences.
 - For land-based noise, required to base noise assessments on what has been reported by other projects as well as those that are planned (based on guesses from other EIAs).
- Conclusion: Participants are relatively comfortable with risk retirement for underwater noise impacts from a single devices or small array deployments.

EMF

- Participants though that because there are no regulatory thresholds that experts will need to decide what is considered unhealthy based on evidence from countries and scientists they trust. It would be useful to think about how this might work conceptually.
- Participants thought that for new projects it would be important to do a resource inventory (or see if it exists), prioritize marine resources under a scope of responsibility, evaluate and compare the device operation against those resources (especially priority resources).
- In the mining sector, without standards regulators were very risk adverse. Not quite the precautionary principle, but close and required at least 12 months of baseline studies before a project went in.
- EMF was touched on at Carnegie's Garden Island project, but there was confidence in engineering components (buried cable) to not have impacts.

- Participants were more concerned with EMF from arrays
- Participants thought that regulators will need to be convinced and proponents of a project will should bring the science to regulators and explain why it is relevant, what the sensitive species are at a site, and why it won't impact them. With no regulatory thresholds, the MRE industry will have to guide the regulators.
- Participants thought that species-specific impacts may be important.
 - In Australia the western Australian rock lobster is one of the most valuable industries, so is likely to have more requirements as regulators will want to know the impact (information won't be able to be transferred from the American lobster, as they are not closely enough related). The fishery is the whole west coast, so it will be hard to move to an alternative environment.
- Conclusion: Participants think that the risk could be retired for single devices or small array deployments, but larger deployments may still require measurements.

Participant Feedback

- Participants thought the material provided prior to the workshop was very useful, informative, and interesting.
- Participants thought the risk retirement process was intuitive and easy to navigate. It was noted that for some projects there may be some case specific additions needed.
- For underwater noise, participants thought the US guidelines were helpful.
- Participants thought that maintaining links across multiple stressors will be important to keep in mind going forward.
- Participants thought it was useful to have OES-Environmental and Aquatera in Australia introducing this concept and noted that there may be a broader audience in Australia that would be interested in the OES-Environmental discussions.

Next Steps

OES-Environmental and ORJIP staff discussed plans to move the risk retirement process into a series of guidance documents to provide an easy to digest resource for regulators.

Brainstorm

- Participants thought that embedding visuals (videos, pictures, etc.) into the guidance documents would be useful.
- Participants noted that we may need to further segment the MRE device discussions as one size doesn't fit all and regulators aren't going to understand the nuances of devices and the differences in environmental impact. It was suggested for categories of devices to list out what environmental impacts would be relevant (for example, how point absorbers and oscillating water columns might provide different levels of risk to different marine resources).
- Participants thought that Australia regulators may be interested in an international regulator forum, but it would depend on the regulator and the topic. It could be most useful to talk with regulators interested in specific issues (such as collision risk, which might also be of interest to shipping regulators) and to have regulators learn from one another. There is lots of turnover in the Australian government and there will a need to institutionalize information as staff leave.
- Participants thought it will be important to map out the agencies that may be applicable for consenting MRE in Australia.

Actions

- Conduct regulator survey with Australian 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 Attendees
- Appendix B: Workshop Agenda
- Appendix C: Workshop Feedback Survey Questions

Appendix A: Workshop Attendees

Attendee	Organization	Country
Andrea Copping	OES Environmental, PNNL	US
Mikaela Freeman	OES Environmental, PNNL	US
Jennifer Fox	ORJIP Ocean Energy, Aquatera Ltd	UK
Ian Hutchison	ORJIP Ocean Energy, OceanTera	UK
Mark Hemer	CSIRO	Australia
Beth Fulton	CSIRO	Australia
Remo Cossu	University of Queensland	Australia
Louise Synnot	BMT	Australia
Geoff Withycombe	BMT	Australia
Stephanie Thorton	Australian Ocean Energy Group	Australia
Kylie Hargreaves	Australian Ocean Energy Group	Australia
Andreane de Chassy	Australian Ocean Energy Group	Australia
Jean-Roch Nader	University of Tasmania	Australia
Kim Taylor	Xodus Group	Australia
Marlène Moutel	Sabella	France
Blair Miller	Scottish Development International	UK

Appendix B: Workshop Agenda

- 10:00 – 10:20** Introductions & Purpose of the Day
- 10:20 – 10:45** Consenting Challenges for MRE in Australia
- 10:45 – 11:15** Environmental Effects of MRE Developments
- 11:15 – 11:30** Break
- 11:30 – 11:50** Risk Retirement & Data Transferability Pathway
- 11:50 – 12:20** Evidence for Risk Retirement & Data Transferability
- 12:20 – 12:30** Instructions for Working Sessions
- 12:30 - 13:30** Lunch
- 13:30 – 14:30** Working Session
 - Case Study on EMF Risks
 - Case Study on Underwater Noise Risks
- 14:30 – 14:45** Break
- 14:45 – 15:15** Brainstorm: Next Steps
- 15:15 – 15:30** Summarize & Wrap-Up

Appendix C: Workshop Feedback Survey Questions

1. Which risk (underwater noise or electromagnetic fields) were you most interested in 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?
6. Please include the name, email, and government office of any Australian regulators you would recommend we contact for the OES-Environmental regulator survey. Through this survey we aim to understand regulatory knowledge, environmental challenges, and paths forward for the marine renewable energy industry.