



## Risk Retirement Workshop Report

European Wave and Tidal Energy Conference (EWTEC)  
September 5, 2019, 14:30-17:30pm  
Napoli, Italy

### 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 electromagnetic fields (EMF) and underwater noise from devices can be considered “retired” for consenting/permitting small installations (single devices and small arrays) of tidal turbines and wave energy converters.

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.

34 members of the marine renewable energy (MRE) community from 11 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 EMF and underwater noise risks, and two hypothetical examples to demonstrate application of the risk retirement pathway. Following the presentation, workshop participants split into two breakout groups to examine the risk retirement pathways with the help of well-defined case studies, existing data sets, the tools developed under OES-Environmental, as well as two subject matter experts (Andrew Gill for EMF and Brian Polagye for underwater noise). The workshop was concluded by a report out of each group’s discussion (see Appendix A for workshop agenda).

### Discussion

- EMF breakouts group discussions:
  - Participants felt that the amount of power carried by single MRE devices or small arrays was not likely to be a risk; however they were interested in potential cumulative effects of EMF and whether we are collecting the necessary data to analyze such effects.
  - Participants identified several gaps in current knowledge that they felt need to be addressed to make consenting decisions:
    - Need to understand extent of magnetic and electric fields for particular cables and variability of power;

- Need additional EMF measurements in the field to improve and validate models;
  - Need to understand potential risks of array subsurface substations and draped cables;
  - Need to determine at what point to revisit a risk (after retiring the risk for one device); and
  - They also expressed the need broadly to create inventories of all animals and habitats potentially at risk from MRE, and to better understand potential behavioral, physiological, and developmental impacts of EMF, largely from laboratory work.
- Participants felt that the wind industry’s regulatory requirements should not be applied to the MRE industry because the scales are so different and that strategic studies should be carried out on larger scale cables from MRE arrays to gain an understanding of the risk.
- Public opinion may be an issue for regulators who say there is no need to do anything further on EMF.
- Important to have strategic environmental assessment so that we understand what is going on in the area and the potential cumulative impacts of EMF.
- Test centers should tackle some of these questions, but they will need funding.
- Developing thresholds may be useful but would be difficult since so much knowledge is needed for individual species (which would likely require a series of studies).
- Conclusion: Participants do not think EMF is a risk, especially in relation to the wind industry, but there is some basic information that would be required to retire the risk for single device deployments.
- Underwater Noise breakout group discussions:
  - Participants identified several gaps in current knowledge that they felt need to be addressed to make consenting decisions:
    - Need for noise propagation modeling for arrays;
    - Need to address countries’ varying requirements (e.g., Scotland and Sweden do not require baseline recordings, while Ireland does).
  - Participants agree that baseline measurements of a device in the water are needed to show that the noise is under existing thresholds and that it should be the developer’s choice to record more measurements (following IEC TC114 Level B recommendations, not regulators’ requirements if levels are below thresholds).
  - Participants noted that different countries have different requirements regarding changes to developments:
    - In Portugal, changes to a proposed development require a new environmental impact assessment to be performed, and transferring data would not be acceptable;
    - In Sweden, increasing a development from one device to an array would require monitoring, and regulators would not accept measurements from the one device only.
  - 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 from exit survey:

- Participants found the workshop materials provided ahead of time useful and well-synthesized.
- Participants found the Risk Retirement Pathway intuitive and easy to navigate.
- Several participants expressed concerns regarding how regulators will accept the risk retirement process and whether a risk can “realistically be brought back” once retired.

### Next Steps

- Continue to work with US and other OES-Environmental 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

- **14:30-14:55** Introduction & Presentation of Risk Retirement Pathway
- **14:55-15:20** Presentation on Current Knowledge of Underwater Noise & EMF Risks
- **15:20-15:30** Instructions for Breakout Sessions
- **15:30-16:45** Breakout Sessions (2 rotations)
- **16:45-17:00** Report Out from Group #1
- **17:00-17:15** Report Out from Group #2
- **17:15-17:30** Summarize & Wrap-up
- **17:30** Adjourn

## Appendix B: Workshop Attendees

<b>Attendee</b>	<b>Organization</b>	<b>Country</b>
Andrea Copping	OES Environmental, PNNL	US
Lenaig Hemery	OES Environmental, PNNL	US
Jennifer Fox	ORJIP Ocean Energy, Aquatera Ltd	UK
Ian Hutchison	ORJIP Ocean Energy, Aquatera Ltd	UK
Maria Apolonia	WaveEC	Portugal
Erica Cruz	WaveEC	Portugal
Andrew Gill	CEFAS	UK
Dan Hasselman	FORCE	Canada
Mark Hemer	CSIRO	Australia
James Joslin	UW	US
Louise Kregting	Queen's University Belfast	UK
Caitlin Long	EMEC	UK
Davide Magagna	European Commission	Netherlands
Raeanne Miller	University of the Highlands and Islands	UK
Anne Marine O'Hagan	MHMRC, University College Cork	UK
Brian Polagye	UW	US
Nolwenn Quillien	France Energies Marines	France
Pal Schmitt	Queens University Belfast	UK
Teresa Simas	WaveEC	Portugal
Jan Sundberg	Uppsala University	Sweden
Pedro Vinagre	WaveEC	Portugal
Bruce Cameron	Envigour	Canada
Caitlin Long	EMEC	UK
Craig Chandler	Mersey Consulting	Canada
Daniel Coles	Simec Atlantis Energy	UK
Ralf Starzman	Schottel Hydro	Germany
Jin Hak Yi	KIOST	Korea
Nathan Tom	NREL	US
Gianmara Giannini	SBAPower	Italy
Giorgio Bacelli	N/A	US
Paulo Rex Suet	University of Porto	Portugal
Constantin Scherdis	University of Tasmania	Australia
Irene Penesis	University of Tasmania	Australia
Remo Cossu	University of Queensland	Australia

## Appendix C: Workshop Exit Survey Question

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. Do you think your country would be interested in joining the IEA OES-Environmental task discussed today? If so, please provide contact information for a potential OES-Environmental representative.