

OES-Environmental Risk Retirement Webinar Notes

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Presenters: Andrea Copping, Mikaela Freeman, Hayley Farr, Deborah Rose

Attendees: 78

Discussion Questions and Answers:

Regarding Step 3: Collect Additional Data of the risk retirement pathway – what kind of data could this be for example?

A: The additional data is collected if uncertainty remains after Step 2. Developers, regulators, researchers come together and determine what data need to be collected. For example: for underwater noise, we have a sense that noise isn't loud from wave device, but may need to collect ambient noise data, get sonogram from particular device, and characterize the baseline environment – that's what we mean. For habitat change, a developer proposing a project in particular location might need to collect existing data of the habitat if it isn't well characterized. This data collection will be site-specific or preference specific.

How do US Thresholds for underwater noise compare with other parts of the world such as EU and UK?

A: The U.S. thresholds are the only numerical thresholds we have found – but we are always looking for others. Please let us know if you are aware of other thresholds that exist.

Is there more recent information on electromagnetic fields (EMF)?

A: Check out the EMF chapter of the State of the Science! Today's presentation was just a smattering of foundational studies, but the chapter provides a comprehensive overview of everything that we know so far from laboratory and field studies.

Can you expand more on how collision risk may be tackled and understood – e.g., new sensing methods, determination of marine animal behavior in high flow environments, experimental tests?

A: One of the reasons why we haven't tackled collision risk for retirement is that it's really tough. At present, the industry is leaning toward using observations of animals in close proximity to turbines, or encounter risk numerical models (adapted from birds and wind turbines). Those models have flaws, and we need more data to validate those models. Underwater video recordings have low chances of capturing low probability events. Video observations are also limited by high turbidity and high flow, but acoustic cameras are coming into play and can help overcome this. This is still an area that needs a lot of active research. Flume data has been helpful to understand what happens to fish when they go through turbines, but we aren't quite there yet for understanding collision risk enough to retire it.

Are you aware of any regulators having formal processes/approaches in place for risk retirement?

A: Not yet. We do know that several jurisdictions have been playing around with the idea. Marine Scotland, Australia. We are at the point where we hope that the concepts are getting some uptake but there are not any formal processes as of yet.

Given there are so many devices and only some have been parameterized, are there going to be any thresholds to qualify for "retirement"? E.g., what if someone designs a noisy wave energy converter (WEC) and noise is "retired" by the others, what then?

A: Standardized measurements are still required (TC 114). If a novel WEC is designed, the manufacturer's specifications of noise would be required to be put forward as part of consenting, and validated. This is really an iterative process – if a device was deployed and then found to be much louder than anticipated, some sort of adaptive mechanism would need to kick in to monitor or mitigate the noise.

Are there any issues around cumulative impacts, and risks that might be "retired" for small numbers of devices becoming significant when there are lots of them?

A: Numerical models tell us to expect more effects from more devices, but we are a long way off from deploying arrays or reaching thresholds where these types of cumulative impacts would be observed. What would happen if we had multiple WECs in an area? What are the cumulative effects from many industries in the ocean? It's terribly difficult to get numerical measurements or anything concrete for these assessments in Environmental Impact Assessments/Environmental Impact Statements. Cumulative impacts, as well as effects from any of these stressors, still need to be considered and are not retired.

How can cumulative impacts be assessed if risk for underwater noise or EMF is retired before a device is even tested in the water? It seems like this might do more harm, as well as be more difficult to re-visit environmental monitoring after the fact. At what point (i.e.: what has to happen) for risk to be un-retired?

A: Adaptive management (AM) is terribly important and is used to set thresholds early on for action. For noise and EMF, it's a little simpler. For noise, with a good sound graph and ambient soundscape, that makes it fairly simple to consent a project with small numbers of devices. We know what it looks like, we can model sound propagation, we can measure it consistently with TC 114 and we have a good understanding for small numbers of devices. Similar for EMF, we know the configuration and emissions, we can model it quite well. For large numbers of devices, monitoring is needed. For collision and other stressors related to animal behavior (such that species behave differently), it is much more tough and we point to AM here.

Has risk retirement been used in other sectors? Positive experiences could help 'convincing' regulators to adopt this for marine renewable energy (MRE).

A: Oil and gas has used the concept but not the term. We found risk retirement used in geotechnical work – it is appearing in the literature and the concepts are turning up in oil and gas, and land-based development. We are working on writing up other analogs for this in the

next year to see how it fits with other industries, and how we can use these findings to support risk retirement for MRE and share these with regulators.

You mentioned developing country specific risk retirement guidance documents. Will this be specific to environmental conditions and species/habitats in those countries?

A: We are in the process of editing and circulating the framework for these guidance documents and need to have these discussions with OES-Environmental country representatives. We have divided the content for the guidance documents into four bins – species/populations at risk, habitat alteration/loss, water quality, and socio-economics – and plan to look at the environmental regulatory field and bring together the evidence base in each category and how it applies to country-specific regulations. Then, we aim to align those regulations with existing evidence so it is readily available. Our hope is that each country representative could look through the lens of their statutes and regulations for those 4 categories to produce accurate, country-specific guidance.

Looking forward to those guidance documents! When do you expect to publish them?

A: We are delivering a draft framework in the next week to Ocean Energy Systems. This will be a major focus over the next year, really depending on each country. Hopefully next spring-summer, but we may be a little optimistic in how long this will take us and the OES-Environmental representatives. The art of this is how far do we delve down. Every project is different – we want to be helpful, and concise. European and US will come out first – especially as Europe may be easier as most of the countries work with similar directives.

How do we incentivize regulators or developers to continue environmental monitoring once a risk has been retired? Retired risks are not deceased but it seems tricky to revisit it once it has declared retired. Would it require direct evidence such as stranded animals with obvious signs of device induced injury to un-retire a risk?

A: This is going to have to fit the comfort level of regulators in a country/region. This is where an active AM program is really important. Determining these markers up front is helpful. AM groups that work well bring together regulators, developers, etc. together to examine monitoring data and adjust monitoring to match concern. How do we know if something bad has happened – we don't. Luckily, even if risk has been retired and monitoring is not required for consent, we can often co-opt device health measurements and monitoring for environmental benefit (especially for underwater noise). Collision risk is the tough one – we will probably be addressing and retiring risk species by species. A lot of interesting information is coming out from MeyGen – that harbor porpoises are pretty aware of turbines and know to keep their distance. In that case it may be obvious risk/harm that would trigger change to monitoring requirements, but it isn't clear yet.

Have you had much buy-in from regulators on your proposed approach to data transferability?

A: We did a whole series of webinars only with regulators (primarily in US). Through these 8 or so, we've moved from skepticism to acceptance and feedback to 'how do I get this data', so we developed the Monitoring Datasets Discoverability Matrix. Feedback from regulators suggest this is really useful. You can use the matrix to say that you have a tidal turbine project, bottom mounted, and are concerned with harbor porpoise – then query the matrix and get access to datasets that are as close to a match as possible. Not many datasets are available currently, but they are coming in and we are always looking for more that we are missing.

Comment: It would be great to organize those kinds of workshops for regulators in Europe as well!

Advancements in environmental monitoring tools and methodology often happen in conjunction with industry when research techniques get applied on a commercial scale. As a practice, should projects that have had risk retired retain some level of environmental monitoring but not have it necessarily weigh on the permitting process? Or should a policy be in place to proactively monitor areas of interest prior to commercial mobilization?

A: As industries grow, they become more efficient. Oil and gas, automobile, etc. For MRE, we are a new industry, going into the ocean with heightened worry. If we wait until natural commercialization and efficiency to happen it will take a very long time and this industry could be at risk of not advancing. AM and risk retirement aim to help move the industry forward faster. Maybe this should be a national government interest – funding for research, monitoring, etc. to continue to build these knowledge bases. Test centers are the optimum places to learn more and add to the evidence base. There is a trend toward not doing environmental monitoring at test centers because it is very expensive to just get in the water, but these are great opportunities that will be missed. If we want this industry to flourish, we cannot put too much more weight on developers to collect more and more data without support.

Great webinar, thanks team. What's the next steps?

A: We are working on an oceanographic systems white paper and the guidance documents. We are pressing forward on collision risk, which is a tough but very interesting challenge from a research perspective. We would like to do a workshop on collision risk this fall or on other aspects of risk retirement. Sign up for Tethys Blasts and/or the MRE webinar list [here](#) to stay in the know!