# WORKSHOP SUMMARY

## MHK Environmental Compliance Cost Reduction Strategies Workshop

**Wednesday, May 3, 2017 | 1:30-3:30 PM ET**
**Location: Capital Hilton**
**1001 16th St NW**
**Washington, D.C. 20036**

### Workshop Objectives

- Share initial findings, gaps, and challenges from the Marine and Hydrokinetic (MHK) Environmental Compliance Cost Reduction Strategies project
- Gain feedback from participants on how to strengthen the project going forward
- Provide a forum for discussion on potential ways to reduce MHK compliance costs and streamline the permitting/licensing process

### Project Purpose and Overview

This three year effort started in FY17 with the objectives of capturing environmental compliance costs and lessons learned from MHK developments that have gone through the permitting and compliance process. The goal is to find ways to improve the efficiency and effectiveness of the permitting and compliance process and reduce costs to encourage investment in MHK projects. The project team is composed of Sandia National Laboratories, Integral Consulting, Kearns & West, and H. T. Harvey & Associates. Step one of the project process, collect data to determine permitting and compliance costs, is currently underway. Step two of the project process, identify cost reduction pathways and step three, develop cost reduction strategies, will follow and are envisioned as an iterative approach to best meet the project goal.

The data collected include costs associated with licensing and post-licensing, including mitigation measures, study topics, background, cost estimates/planning, and recommendations/best practices. All data are aggregated to ensure confidentiality and protection of proprietary information as deemed necessary by the participating companies and agencies. The project team is working with industry and Federal/State regulatory agencies to obtain the data and are looking to understand regional perspectives and varying experiences in the permitting/licensing process. Cost data and general information collection is ongoing and preliminary results presented during the workshop include a range of projects that are undergoing or have undergone the permitting/licensing and post-licensing process.

### Preliminary Results: Economic Analysis and Qualitative Findings

Preliminary results show that there is a wide range of total environmental cost per survey site and differences between the cost/kW capacity (with capacity loosely defined at this stage as device capacity, or permitted site testing capacity). Some sites have a low total cost, but high cost/kW. Other sites have low cost/kW, but higher total cost. Determining the cost/kW helps to normalize the data to determine what the cost for an activity could be. When broken into categories (fish, physical environment, State/Federal permitting, and other licensing costs), the preliminary results show the highest

environmental cost category is site specific. One site may spend the most on activities related to fish, others spend the most on permitting. Cost ranges for field studies show that studies for fish presence/type/behavior are the highest while entanglement is the lowest. However, some categories had low sample sizes at this early stage. Scatterplots to evaluate cost (actual and projected) versus capacity have also been created to help determine if environmental costs increase with capacity (e.g., project size). At this early stage there are not many assumptions. As more data are obtained, the results can be broken out by project type, region, stage of project, and even if a rare species or circumstance has driven up costs.

*Participant Feedback on the Preliminary Economic Analysis:*

- Consider examining project costs by license type and/or current stage in the licensing process
- Consider differentiating study costs by whether they are baseline/pre-permit or post-license
- It may be useful to distinguish study costs relative to whether they addressed (listed) endangered species or not
- Conduct historical analysis to determine whether regulatory and compliance costs decreased over time
- Consider adding vessel traffic as a study category. Participants indicated they did studies on vessel/navigation hazards.
- Suggestion that an additional metric other than cost could be staff time and duration for permitting
- Costs of delays or long permitting timelines would be good to understand, the actual versus expected costs.

After reviewing the initial economic feedback, the project team shared initial qualitative findings and challenges/gaps in information.

*Initial findings:*

1) **Agencies are unfamiliar with MHK effects** – adopting a very conservative approach to address regulatory requirements
2) **Lack of cohesive knowledge of existing science and MHK project experiences** – not all regions and regulators have the same knowledge or experience
3) **New entrants/nascent industry** – not all developers understand the permitting process
4) **Limited permitting precedent** – with a only a few successfully permitted projects, there are wide ranging costs
5) **Cost and time intensive information requests** – conservative approach has led some regulators to request significant data collection and monitoring efforts, which can increase costs
6) **Insufficient funding** – often inconsistent and short-term which can delay, suspend, or halt projects
7) **Many permits/agencies roles in the process** – many different compliance requirements that are not always integrated or coordinated
8) **Stakeholder interests** – often a time-investment, but necessary for successful permitting
9) **New use of marine space** – MHK is not a traditional use and is not always welcomed

*Challenges & Gaps:*

1) Varied responses on most/least difficult challenges
2) Lack of knowledge regarding baseline conditions
3) Need more study on positive impacts of MHK
4) Securing funding and getting through the permitting process is a "chicken and egg" problem
5) Need future research organized around scale, micro, meso, and macro impacts and new technology/methods to improve understanding of species interactions with projects

**Participant Discussion**

The group discussion highlights follow (*listed in the approximate order they were raised—this is not a prioritized list*).

- There is a lot of data collected in the U.S. and in Europe and the information collected is starting to show that fish are not the biggest risk. Fish could be an outlier to costs associated with licensing, a result of early emphasis for the 'first' projects. Further analysis and investigation to understand this 'learning curve' could be a helpful strategy for reducing licensing costs.
- The earliest projects have the highest study costs. If this study looked at post-pilot costs, the costs could be normalized. Sorting the economics out by timeline and type of project could provide insights on costs.
- Because not all companies have accounting systems that are set up for this type of data collection, the confidence level is sometimes low due to having to guess and make assumptions on costs. This analysis must acknowledge the range of confidence levels and amount of guesswork involved in considering the actual costs and therefore the cost reduction strategies.
- Recommendations should use quantitative studies to include positive factors (e.g., fish habitat created) and should show the benefits of having structures in the water.
- Labor associated with the permitting process would also be good information to have. For example, with labor/core staffing costs, if a project is delayed by several years due to permitting, there are embedded costs that should be considered as part of the project permitting costs. Also, looking at labor costs as a percentage of the total environmental permitting costs would be beneficial. Assessing the burn rate of a project during pre-deployment could speak to the viability of the industry. If work on a project is delayed or stopped, there are still overhead costs.
- Mandatory (costs required by the agencies) vs voluntary (costs offered by the applicant for permitting) costs should also be captured in the analysis.
- There needs to be a discussion of retired risk for environmental factors over time. For example, collision and EMF, have had extensive research and monitoring which has suggested either the risk is low and no study is needed, or the mitigation action is understood and can be incorporated into the permit without additional study. Development of a timeline/progression of retired environmental risk over time would be useful.
- There could be other ways to look at what is driving costs other than cost/kW. The cost could be timeline based or regional. Cost/kW could be misinterpreted by those outside of the industry and finding other ways to communicate this would be useful.
- Looking at the data via project phase might also help determine how costs can be reduced.
- Adaptive management needs to be framed carefully. On the one hand, an agency can shut you down at any time (if an impact is found the device needs to be removed). On the other hand, it

allows you to adapt the project in case you overestimated the mitigation required during project implementation, and you determine that lower cost monitoring or mitigation is appropriate.

- There needs to be a methodology for proportioning the level of risk with the scale of the project. Relative risk is not well understood by agencies. A neutral/scientific body could help regulatory agencies understand risk and also how to retire risk.
- Getting the agencies involved in the Sandia effort is important. At the project level, for example, an agency assigned a threshold for acoustic emissions, but did not tell the developer what would happen if the threshold was exceeded.
- Suggestion to include USCG in the federal agency outreach and interview process.
- Having an integrated licensing timeline (e.g., FERC ILP) would help with project risk, create standardization, and set costs.
- While lessons from other industries can be applied to MHK, there is a challenge in knowing how much to set aside for the MHK permitting process.
- There could be opportunities for centralization. For example, the USACE has "centers of excellence" with experts in certain areas. It may be useful in the MHK process to have people in the different agencies who understand the permitting and regulatory process and bring marine /MHK permitting expertise.
- There needs to be a regulatory framework, to provide regional baseline data and information that an individual project could build from. There are no standards for monitoring needs, one approach could be to form a regional task force like BOEM has done to provide regional guidance. This could also address institutional memory (staff changes, time gaps, etc.).
- USCG could be another agency to look at because they had a leadership role for a developer working in a tidal strait.
- Developing universities and agency partnerships is important. Agencies want information, but obtaining that information is cost prohibitive. Partnering with a university can help get data and analyze it, potentially for less cost.
- Increasing regional data sets and baseline studies is important. There is a lack of baseline information for and understanding of the environment in which MHK projects operate.
- Cost of DOE being lead agency and requirement for additional consultation requirements and costs.
- Discussion on collision risk being the largest factor in Europe. That led into a comment on having more marine mammal research.
- There was discussion on standardizing requirements leasing, licensing across projects, though also acknowledgement that there are state/regional differences between regulatory requirements.
- If DOE has funded part of the NEPA consultation, it would be helpful to separate the DOE funded effort from the project funded effort.

The workshop adjourned at 3:20 pm.

**Participants**

| Name | Organization |
|---|---|
| Mary Ann Adonizio | Verdant Power |
| Gabriel Alsenas | Florida Atlantic University |
| Jason Busch | Pacific Ocean Energy Trust |
| Grace Chang | Integral Consulting |
| Andrea Copping | Pacific Northwest National Laboratory |
| Alexandra DeVisser | U.S. Navy |
| Steve DeWitt | Department of Energy |
| Lindsay Dubbs | University of North Carolina |
| Sam Eaves | Department of Energy |
| John Ferland | Ocean Renewable Power Co. |
| Simon Gore | Department of Energy |
| Dan Hellen | Oregon State University |
| Craig Jones | Integral Consulting |
| Justin Klure | P.E. Ventures, LLC |
| Sam McWilliams | Integral Consulting |
| Michael Murphy | TRC Solutions |
| Jayce Philpott | Department of Energy |
| Kaus Raghukumar | Integral Consulting |
| Kelley Ruehl | Sandia National Laboratories |
| Ron Smith | Verdant Power |
| Bill Staby | Resolute Marine |
| Garret Staines | Pacific Northwest National Laboratory |
| James VanZuieten | Florida Atlantic University |
| Luis Vega | University of Hawai'i |
| | |
| **Staff** | |
| Geoff Klise | Sandia National Laboratories |
| Sharon Kramer | H. T. Harvey & Associates |
| Jesse Roberts | Sandia National Laboratories |
| Hanna Waldhorn | Kearns & West |
| Erica Wales | Kearns & West |
| Anna West | Kearns & West |