3rd International Symposium on
Energy Challenges & Mechanics
- towards a big picture

7-9 July 2015
Aberdeen, Scotland, UK

Marine mammals and tidal-stream turbines: what are the issues of concern and how are they being resolved?

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Accepted for publication on 12th June 2015

The possibility that marine mammals will be injured by striking tidal-stream turbines or avoid them to the extent of excessive area exclusion are among the most pressing environmental consenting issues facing this emerging family of technologies. Large animals colliding with turbine blades may also have catastrophic implications for the devices themselves. Unfortunately, due to the inherent difficulties of studying marine mammal distribution and behaviour underwater as well as the novelty of the machines themselves, information upon which to base robust assessments of risk are extremely limited. Consequently, a variety of research projects in multiple countries are underway to investigate different components of these questions. In this presentation we review potential marine mammal-related issues, including collision and injury risks, acoustic impacts, displacement, barrier effects and attraction. We then outline what research approaches are being applied and how they relate to one another. The novelty of these challenges, especially working in waters flowing at velocities approaching research vessel speed, has prompted the development of several innovative scientific tools as well as focusing effort onto a previously little studied habitats. However it will be a challenge for the biological research community to keep pace with the turbine sector, learn from the many globally dispersed initiatives and develop a generic understanding of animal-machine interactions. Post-deployment monitoring will therefore be key to derisking this issue or developing mitigation options.

Keywords: Marine mammal, tidal turbines, collisions, risk, environment