CRITICAL REVIEW OF ANTI-FOULING STRATEGIES USED ON MARINE RENEWABLE ENERGY CONVERTERS DEPLOYED IN REAL SEA CONDITIONS

Florence Ungaro[1], Elaine Buck[2], Steven Pyke[3]

[1] Florence Ungaro, EMEC, European Marine Energy Centre, Old Academy Building Centre, Stromness, Orkney, KW16 3AW, florence.ungaro@emec.org.uk
[2] Elaine Buck, EMEC, European Marine Energy Centre, Old Academy Building Centre, Stromness, Orkney, KW16 3AW, elaine.buck@emec.org.uk
[3] Steven Pyke, EMEC, European Marine Energy Centre, Old Academy Building Centre, Stromness, Orkney, KW16 3AW, steven.pyke@emec.org.uk

The European Marine Energy Centre (EMEC) undertook a critical review investigating biofouling on marine energy converters and their associated systems to formulate mitigation recommendations. The investigation used operational data collected from the EMEC test sites including deployments of EMEC's own equipment as well as that of developers' when testing their wave or tidal energy converters. A questionnaire was sent out to developers to gather further details and specifications on anti-fouling mechanisms used, application methodology and success rate. The study considered the approach to dealing with biofouling by looking at specific components of different materials that had been treated or left untreated and if left untreated, the reasoning. The study recorded the different coatings used, on which materials they were applied, the conditions they were deployed in (water depth, deployment duration, etc) and evaluated the effectiveness of these coatings. In some cases, anti-fouling strategies other than applying coatings were used and where this was the case, the success of the alternative method was noted. Where possible, lessons learned were recorded and potential improvements to the anti-fouling strategies and application methodology made.

The outputs of this study can better inform future deployments of environmental instrumentation in real sea conditions by showing what coatings or alternative methods of mitigating biofouling have been effective, thus sharing information and lessons learnt from previous deployments. The study has helped to highlight limitations of some current methods and can help to steer the development of future anti-fouling techniques or maintenance requirements.

Figures 1 and 2 give an insight into the study, showing the EMEC Test Support Buoy (TSB) before and after deployment which had been coated with Jotun paint for the antifouling protection. The duration of the deployment was 6 months over spring and summertime which resulted in low levels of biofouling as seen in figure 2.

FIGURE 1 - EMEC TSB BEFORE DEPLOYMENT

FIGURE 2- EMEC TSB AFTER DEPLOYMENT

ACKNOWLEDGEMENTS

EMEC would like to acknowledge that this review was funded by the US Department of Energy under DE-EE0006788.

Preprint submitted to 2018 6th Annual Marine Energy Technology Symposium.
Received January 17, 2018.