ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name

Tom Clements

Date submitted

November 6, 2014

Project name: Shapinsay Sound tidal test site

☐ Planned ☒ In Operation ☐Completed

Project description:

Project Developer: European Marine Energy Centre Ltd.

Technology Developer:

Technology type: Multiple

Resource (wave, tidal): Wave

Project scale (test site, prototype, array, commercial): Nursery test site

Installed capacity (MW): Non-grid connected test site. A purpose-built Test Support Buoy moored on site acts as a power sink to allow load-dumping of any electricity generated as heat dissipated to air.

Project Website: http://www.emec.org.uk/facilities/scale-test-sites/

Launch Date: September 2011

Additional Description: In addition to the grid connected tidal test site at the Fall of Warness, EMEC also have a tidal test site that is not connected to the grid aimed at providing less challenging conditions for scale prototypes. The site provides a more flexible sea space acting as a stepping stone between the test tank and real sea conditions. The 0.4 x 0.9km site is located in Shapinsay Sound, to the north-east of Kirkwall in water depths of 21-25m and experiences fairly benign current velocities with a peak tide of 1.5m/s.

At the site EMEC offers developers the use of a bespoke test support buoy. If required, the device under test will be connected to the test support buoy via two umbilical cables: one for power transmission and the other for control and communications. These buoys can relay data by wireless technology allowing developers to monitor performance remotely, as well as dissipating electricity generated by the device. The buoys are also equipped to supply the marine energy devices on test with power and act as navigational aids.

Each test site comprises one berth with pre-laid foundation and attachment points, and adjacent 'blank' test area. The pre-laid foundations comprise 5m x 5m x 2m gravity-base frames loaded with densecrete blocks for equipment moorings. An area of seabed is also available for rehearsal or deployment of other tools and techniques.

Export Cables**:** As the site is not grid connected, no export cable is present.

Onshore Infrastructure: N/A

Vessel Spread:

Vessel type	Activity	Comment
Workboat	Used to install anchors and test support buoy	Exact vessel used unknown

Location: The EMEC Shapinsay Sound nursery tidal test site is situated adjacent to the Orkney Mainland to the north-east of Kirkwall in the Orkney Islands, Scotland. The two test berths on site range from 21-25m water depth.

Coordinates: 58.996495°, -2.875706°

Process status: Site selection surveys and environmental studies were carried out in 2009-10. Construction of the EMEC Shapinsay Sound nursery tidal test site was completed in 2011 and EMEC welcomed their first client on site shortly afterwards. EMEC hold a valid consent for the installation of an additional set of foundations which gives the potential for two serviced berths to become available in future. The following is a list of EMEC clients:

- Flumill - installed 2011
- Nautricity - installed 2014

Licensing Information: EMEC holds an overarching site licence, simplifying the consent process within an agreed envelope of activity. Two consents are required for installation of marine energy converter devices at the scale test sites:

- Marine Licence issued by the Regulator, Marine Scotland; and
- Harbour Works Licence issued by Orkney Islands Council (OIC).

A developer wishing to deploy a device at the test site must provide an outline of the proposed project. This document must also identify any potential device-specific environmental or navigational risks, as well as any proposed mitigation measures. This information will be submitted alongside EMECs application to update their generic Marine Licence, a process which must be carried out for every new development at the site. MS-LOT typically requires 6-8 weeks from receipt of application to issue a licence amendment. EMEC is also required to give OIC at least 21 days' notice of each new developer wishing to install at its scale sites.

Licencing conditions: N/A

Key Environmental issues: Although some seals have been recorded in the area of the site, SNH have commented that this area is not a site of concern. There have been sporadic sightings of cetaceans within the observation area, in particular Harbour Porpoise and Risso's Dolphin. Scapa Flow is an important wintering area for many species of marine bird. In relation to these species at the sensitive periods, the key issues to be addressed within the developer's environmental monitoring plan are:

- Displacement due to noise (during installation, maintenance, operation and decommissioning of device)
- Displacement due to physical presence of device
- Physical harm caused by collision
- Physical harm caused by entanglement in device moorings
- Physical harm caused by noise

Environmental webpage: http://www.emec.org.uk/facilities/scale-test-sites/

Mitigation measures: Where appropriate developers are required to implement their own mitigation measures should activities overlap with sensitive times of the year for marine wildlife.

Baseline studies and project effects studies: EMEC Tidal Test Site				
General description	The following field surveys were undertaken (or commissioned by) the EMEC to inform baseline characterisation.			
Receptor	**Study description**	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Physical environment	Initial site selection: Bathymetry commissioned by EMEC to Netsurvey Ltd.	Geophysical survey.	Water depths across the area compared well with the existing Admiralty Chart data, although the 20 m contour extends 140 m further west than previously thought to be the case.	Completed (2010)
Benthos	Initial site selection: determining biota and sediment particle size.	Grab sampling.	The type of sediment encountered reflects the degree of water movement that the site experiences, with little fines and a variety of rock and shell fragment size. Surficial sediments generally comprised maerl, maerl fragments, coarse sand, shell fragments, large shell fragments and stones. A relatively diverse benthic assemblage was identified. The community is considered to be predominantly a surface feeding one, with suspension feeders such as polychaetes, *Jasmineira caudata*, and the surface detritus feeding *Polycirrus norvegicus* featuring strongly in numerical terms. The survey also reports the presence of maerl.	Completed (2010)
Reports or papers	• Moore, 2009. SNH commissioned report No. 319 • Scapa Flow Scale Site: Environmental Description. 2011. Available [Online] http://www.emec.org.uk/facilities/scale-test-sites/ Accessed 04/11/2014.			

Monitoring and adaptive management:				
General description	The following measures were outlined in the Environmental Description.			
Receptor	**Monitoring program description**	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Benthos	Benthic grab analysis	Survey samples sieved and analyzed regarding species and abundance	Study undertaken to assist in setting up the scale site, no further work deemed necessary unless additional or different types of infrastructure are proposed	Completed (2010)
Birds and mammals	Wildlife observations	Observations of birds and mammals by EMEC wildlife observers	Raw data is publically available, however no report published as of yet.	On-going
Reports or papers	• Scapa Flow Scale Site: Environmental Description. 2011. Available [Online] http://www.emec.org.uk/facilities/scale-test-sites/ Accessed 04/11/2014. • Raw wildlife observational data available at http://www.scotland.gov.uk/Topics/marine/science/MSInteractive/Themes/EMEC-Wildlife/Scale-Sites. Accessed 04/11/2014 • Scapa Flow Wildlife Observations Methodology. 2010. Available [Online] http://77.68.107.10/EMEC_Wildlife/Scapa_Flow/Scapa%20Flow%20Observation%20Methodology%20v1.00.pdf Accessed 04/11/2014.			
Research projects	• Marinet			