1 ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person filing the form (can opt to omit from on-line form) Date submitted

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Project name: EMEC Scapa Flow non grid-connected wave test site

Project description:

Project Developer: European Marine Energy Centre Ltd.

Technology type: wave devices

Resource (wave, tidal, wind): wave

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

Capacity: 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.

Additional Description: The EMEC Scapa Flow nursery wave test site offers a non-grid connected test berth with pre-laid foundations for the testing of full scale or partial-scale versions of wave devices in less challenging sea conditions to those found at EMEC's main wave test site. A second berth offers developers the option of laying their own foundations, or alternatively the berth can act as a designated lay-down area for rehearsal of operational techniques. Devices to be tested at the EMEC Scapa Flow nursery test site may be either (i) full size, but to be deployed for a short duration or (ii) of smaller scale deployed for durations up to one year. Elements being tested will include devices and their components, mooring arrangements, foundations and deployment techniques. Device testing can, if required, be supported by EMEC's own purpose-built Test Support Buoy, which serves three key functions: (i) It acts as a power sink to allow load-dumping of any electricity generated as heat dissipated to air. (ii)It enables measurement of device performance and facilitates data transfer to shore via wireless technology. (iii) It is equipped to act as a Navigational Aid when present on the site.

Developers testing at EMEC's Scapa Flow nursery test site can also benefit from a streamlined consenting process, whereby developers whose devices fall into the pre-consented envelope of parameters have the option of using EMEC's generic site consent, dramatically cutting down the time taken to consent deployments.

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

Location:

The EMEC Scapa Flow nursery wave test site is situated in the natural harbour of Scapa Flow south of Kirkwall in the Orkney Islands, Scotland. The two test berths on site range from 21-25m water depth.

Coordinates of the EMEC Scapa Flow nursery wave test site:

EMEC Scale Test Site	Corner 1	Corner 2	Corner 3	Corner 4
Scapa Flow	58º 53.950'N 02º 56.500'W	58º 53.170'N 02º 56.500'W	58º 53.170'N 02º 57.500'W	58º 53.950'N 02º 57.500'W

Process status:

Site selection surveys and environmental studies were carried out in 2009-10. Construction of the EMEC Scapa Flow nursery wave test site was completed in 2011 and EMEC welcomed their first client on site in 2012. 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 EMEC nursery wave test site at Scapa Flow is expected to continue to be operational so long as there is a need for testing in the benign real-sea regime the site enjoys.

Licensing information (brief description):

EMEC hold a valid generic Marine Licence which obviates the need for developers whose devices fall into the consented envelope of device parameters to apply for their own Marine Licence. Thus EMEC apply to Marine Scotland for an amendment to their generic Marine Licence to include developer's device details. This gives a reduced consenting time of 1-3 months. Developers whose devices fall outwith the consented envelope of device parameters will need to apply for their own Marine Licence, which may take 3-6 months to be processed.

Key Environmental issues: *Data gathering is ongoing at the test site and once analysed site sensitivities will be updated accordingly. At the time of commissioning, the main environmental consideration at the EMEC Scapa Flow nursery wave test site was the presence of wintering seabirds such as Slavonian Grebe and Great Northern Divers.*

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

Baseline and project effects studies:				
General description				
Receptor	**Study description including question and/or objective** (several can be listed per receptor)	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Physical environment	Wave climate study	Analysis of waverider data	Monthly wave reports	Completed, Jan – May 2010
Physical environment	Initial site selection: Bathymetry	Geophysical survey	Water depths ranged from 15 to 30m across the site	Completed 2010
Physical environment	Initial site selection: Geology	Review of British Geological Survey Charts (BGS, 1982)	Undifferentiated old red sandstone covered by slightly gravelly muddy sand	Completed 2010
Benthos	Initial site selection: determining biota and sediment particle size	Grab sampling	Moderately low energy site. "Sheltered Muddy Gravels" and "Subtidal Mixed Sediments"	Completed 2010
Seabed habitats, species assemblages and biotopes	Marine Scotland marine survey programme	Video and photographic stills imagery	Moore, 2009. SNH commissioned report No. 319	Completed 2009
Fish and fisheries	Considered as part of site Environmental Description	Desk based review Consultation with local fishing organisations	Some populations of commercially important fish species in Scapa Flow, however the site is not visited by fishing vessels other than occasional use by a small number of creeling vessels	Completed 2010
Large vertebrates	Baseline Acoustic Characterisation	Seabed-mounted hydrophone deployments	Results not yet available	Due to complete 2012
Large vertebrates	Considered as part of site Environmental Description	Desk based review Consultation with Sea Mammal Research Unit, SNH	Nearest known grey seal haul-out site 4 km away, number of animals is low. Closest harbour seal haul-out is 3km away. Test site is not an area of concern for seals. Cetacean fauna of Orkney is one of richest in UK, however no	Completed 2010

			known resident cetacean populations in the Orkney area	
Birds	Considered as part of site Environmental Description	Desk based review Consultation with RSPB, SNH	Species of conservation significance on Annex I of the Birds Directive or Annex II of the Habitats Directive are present but the site is not thought to be integral to significant groups of any species. Sensitive period for seabirds April – October, divers and grebes in winter and least sensitive period June – September. Inshore waterbirds use the area in winter.	Completed 2010
Navigation/ marine users	Navigation Risk Assessment	Desk study reviewing AIS shipping data, vessel monitoring logs, government fishing surveillance data, SAR resources, historical maritime incidents & RYA UK Coastal Atlas data. Hazard review workshop. Consultation with stakeholders	Navigation Risk Assessment Report. Risk deemed to be "broadly acceptable" due to careful site selection and minimisation of site footprint. Risk control measures include marking on UKHO Charts, issuing Notices to Mariners, Emergency Response Planning with emergency services such as RNLI and stakeholder engagement	Completed 2010
Reports and papers	Moore, 2009. SNH commissioned report No. 319			
Research projects	http://www.emec.org.uk/research/			

Monitoring and adaptive management				
General description				
Receptor	**Monitoring program description including question and/or objective** (several can be listed per receptor)	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
Physical environment	Hydrographic resource study	Waverider measurement studies	Collection of raw wave data	Underway since May 2010
Large vertebrates Birds	Wildlife observations programme	Land-based observer	Species activity data used in support of licence applications	Underway since June 2010
Reports and papers				
Research projects	http://www.emec.org.uk/research/			