

ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name

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Date submitted

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Project name: Falmouth Bay Test Site (FaBTest)

Planned In Operation Completed

Project description:

Project Developer: Falmouth Harbour Commissioners

Technology Developer:

Technology type: Multiple

Resource (wave, tidal): Wave

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

Installed capacity (MW): Non-grid connected test site

Project Website: <http://www.FaBTest.com/>

Launch Date: 2011

Additional Description: FaBTest is a 2.8km² non grid connected, pre-consented nursery test site consisting of three test berths situated within Falmouth harbour. It is located between three and five kilometres offshore in Falmouth Bay, approximately 4.5km from the entrance of Falmouth Harbour. Due to the site's pre-consented status, any device conforming to the design envelope may be deployed subject to scheduling and berth availability. The device envelope allows for the following:

- Substantially buoy-shaped device with a maximum diameter of 30m;
- Substantially box-shaped device with a maximum dimensions of 30m x 30m or equivalent area
- Substantially tubular-shaped device with a maximum length of 180m;
- Floating platform type device with maximum dimensions of 35m x 35m or equivalent area; and subsystem connectors and umbilicals
- Mooring systems, restricted to gravity and drag embedment anchors.
- Guarded underwater turbines

Mooring systems are restricted to gravity and drag embedment anchors. Guarded underwater turbines are also permitted and work towards achieving consent for a defined range of floating wind devices is underway.

Due to the pre-consented status, the application process for deployment on FaBTest is relatively straight forward. Upon application the developer must provide evidence of engineering due diligence, environmental and other risk assessments, as well as deployment and decommissioning plans and evidence of required insurance and financial bonds.

The site itself offers water depths from 15m on the northern boundary to 50m on the eastern side of the southern boundary and seabed types of rock, gravel and sand. The site is sheltered from prevailing south westerly wind and swell directions but is exposed to significant sea states from the east and south east. This combination enables the high levels of accessibility to the site, but also provides significant testing conditions. As a result FaBTest provides a step in the device development process, between tank testing and demonstration deployment. It allows the testing of marine energy technologies (concepts or full scale devices), components, moorings and deployment procedures in a moderate wave climate.

The peak tide height range is around 6.0m while the peak tidal surface current is around 0.8m/s. Wave and tidal climate modelling results can be found at <http://FaBTest.com/sites/default/files/Appendix-9-FaB-Test-site-characteristics-05.03.2012.pdf>.

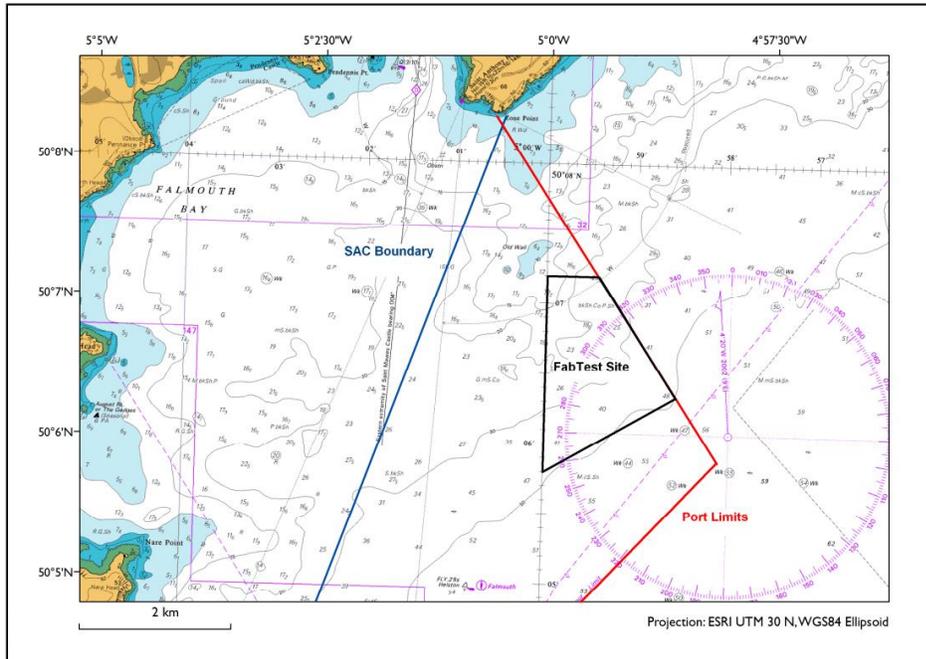
Export Cables: As the site is not grid connected, no export cable is present. All produced electricity is consumed on site by a dump load.

Onshore Infrastructure: N/A

Vessel Spread:

Vessel type	Activity	Comment
Workboat	Used to install dump load	Exact vessel used unknown

Location: Falmouth Bay, Cornwall.



Coordinates: Between the four corners of:

- 50.12222°N, 5°W
- 50.10556°N 5°W
- 50.88617°N 4.99556°W
- 50.89917°N 4.98333°W

Process status: Test site is in operation and has been used by developers.

- Bolt 'Lifesaver', Fred Olsen – installed 2012

Licensing Information:

Falmouth Harbour Commissioners (FHC) hold a Marine Licence issued by the Marine Management Organisation (MMO) which licenses certain MEC development test works according to set procedures and conditions. Similarly, FHC has a seabed lease agreement with The Crown Estate (TCE) allowing the use of the seabed, again according to certain procedures and conditions.

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The FaBTest site is administered by Falmouth Harbour Commissioners supported by a steering group with representatives from industry, academia, agencies and other stake holders. The steering group is divided into two sub-groups, a core group further named as the 'Regulatory Body' and the industrial

group. The Regulatory Body has two permanent members, Falmouth Harbour Commissioners (FHC) and the University of Exeter (UoE). The specific task of the Regulatory Body is to implement a diligence process to establish that each specific FaBTest installation proposal meets with the requirements according to the Marine Licence, FHC regulations, The Crown Estate (TCE) lease and good practice in accordance with stakeholder expectations. In so doing the Regulatory Body advises and informs the decision of FHC to approve or decline an application for a berth at FaBTest.

This process includes reviews of the following documents.

- Application form
- General overview of the project
- Engineering assessment & general arrangement drawing
- Independent validation of the mooring design
- Quality, Health, Safety and Environment (QHSE) management plan
- Project execution plan
- Decommissioning plan
- Emergency response plan
- Navigational risk assessment
- Seabed habitat risk assessment
- Environmental risk assessment
- Proposal for noise monitoring
- Description of any deviation from the Specification for Navigational Safety
- Insurances
- Security bonds

Based on the outcome of the assessment meeting, FHC will authorise or refuse a berthing application. In the case of a refusal, details of any deficiencies will be reported back to the applicant in order to assist with a re-submission.

Licencing conditions: N/A

Key Environmental issues

The main environmental issues in the test site concern the seabed habitat and disturbance from anchor installation and presence. FaBTest encompasses five different seabed habitats. Of these five, maerl beds and subtidal sand gravels are classified as 'Habitats of Conservation Interest'. However the maerl

within FaBTest site is dead gravel rather than living maerl. A sensitivity analysis of the impact was undertaken.

Mitigation measures: N/A

Baseline studies and project effects studies: FaBTest

General description				
The following field surveys were undertaken (or commissioned by) the developer to inform baseline characterisation.				
Receptor	Study description	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Anthropogenic noise	Acoustic site characterization	Underwater noise was monitored using an Autonomous Multichannel Acoustic Recorder (AMAR) mounted on the seabed in 25m (above chart datum) water depth. The AMAR was shielded from trawling / scallop dredging activities by placement adjacent to a large special mark buoy.	N/A	Completed (2011)
Physical environment	Current and wave characterization	An acoustic Doppler current profiler (ADCP) was tethered to the buoy. The ADCP was set to continuously record current and wave activity. The ADCP was deployed to inform developers of the wave climate and to provide current and wave references for the noise data.	N/A	Completed (2011)

Benthic	Seabed imagery	The seabed condition were monitored using video imagery at sample points along two transect lines with sample points at 200m intervals. The positions of the sample points were recorded and replicated (within the bounds of GPS accuracy) during each sampling study.	N/A	Completed (2011)
Geophysical survey	Multibeam Bathymetric Survey (MBS) Shallow seabed penetration using a Sub-Bottom Profiling (SBP) Side Scan Sonar (SSS) Grab Samples	MBS High resolution bathymetry to ensonify entire area with particular emphasis on detection of natural upstands and debris. Shallow seabed penetration using a SBP techniques to ascertain sediment thickness over bedrock within the survey extents. High resolution SSS acquisition across the entire survey extents presented as geo referenced mosaic seabed imagery. Collection of sediments samples over 12 pre-defined locations supplied by University of Exeter using mechanical grab techniques.	The MBS data shows in high resolution the change in bottom type throughout the site, from predominantly sand in the south east to rocky outcrops in the northern area. SBP show areas of sand build up in the south of the survey area but very little accumulation around the rocky outcrops in the north. SSS produced high & medium resolution geo-referenced SSS mosaic images (GeoTIFF), individual high resolution geo-referenced SSS records (GeoTIFF), raw SSS data files. Image records of sediment grabs were taken.	Completed (2014)
Reports or papers	<ul style="list-style-type: none"> • Guide to Deployments & Application Process Requirements. FaBTest. 2014. Available [Online] http://fabtest.com/sites/default/files/Guide%20to%20Deployments%20and%20Application%20Process%20Requirements%20v6%20020514.pdf. Accessed 13/11/2014. • Insight Marine Projects. FaBTest Geophysical Survey. Available [Online] http://fabtest.com/sites/default/files/REP-0191-J64567%20Report%20of%20Survey%20RevA1.pdf. Accessed 13/11/2014. 			

Monitoring and adaptive management: FaBTest				
General description		The table provides a list of the monitoring data carried out		
Receptor	Monitoring program description	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Benthic	Video monitoring	Baited Remote Underwater Video Systems (BRUVS) have been used since 2011 at the Falmouth Bay Test Site (FaBTest) to monitor the seabed environment pre- and post- deployment of wave energy devices.	N/A	Underway
Marine Mammals and anthropogenic noise	Noise characterization	Passive acoustic monitoring (PAM) devices have been used at the site, including: a broadband sound recorder that records from 10 Hz to 32 (or 48) kHz and a C-POD that detects echolocation clicks of dolphins and porpoises. These PAM devices are deployed for around two months at a time and have been recording the local soundscape since March 2012.	N/A	Underway
Reports or papers				
Research projects				