



OYSTER1

Name of person filing the form

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Project name: Oyster 1

Project description:

Project Developer: Aquamarine Power

Technology type: Oscillating Wave Surge Converter

Resource: Wave

Project scale (test site, prototype, array, commercial): Single device.

Installed capacity (MW): 350kW

Additional Description: The Oyster™ 1 was essentially a wave energy converter located at a nominal water depth of 12m which in many locations is relatively close to the shoreline. The system comprised of a buoyant flap, 18m wide and 10m high, hinged at its base to a sub-frame which sat on 4 pre-installed piles with additional latching anchors into the rock seabed. The surge component in the waves forced the flap to oscillate which in turn compressed and extended two hydraulic cylinders mounted between the flap and the sub-frame to pump water at high pressure through a closed loop pipeline back to shore. Onshore a hydro- electric plant consisting of a Pelton wheel turbine driving a variable speed electrical generator coupled to a flywheel. Power flow was regulated using a combination of hydraulic accumulators, an adjustable spear valve, a flywheel in the mechanical power train and rectification and inversion of the electrical output.

Project Website: <http://www.aquamarinepower.com/projects/oyster-1-orkney/>

Location: The device was installed at European Marine Energy Centre (EMEC) wave device test area in Billia Croo, Orkney.

Coordinates: 58.959105°N, 3.376339°W

Process status:

Oyster 1 delivered over 6000 offshore operating hours, survived two winters at sea and performed in line with predictions made from our design model. Oyster 1 also achieved continuous 24 hour generation and successfully demonstrated the feasibility of using wave energy to pump high pressure water to an onshore hydro-electric turbine to create electricity. Oyster 1 generated significant operational experience, learning and data which has feed into the design of Oyster 800.

The flap was decommissioned by Orkney Towage & Leask Marine in March 2011.

Current status of the project implementation and future developments/expected operation date:

The Oyster 1 device was built with a two year design life and operated from 2009 until 2011. In spring 2011, we took advantage of calm weather conditions to decommission the device in preparation of the second generation design of Oyster 800.



Licensing information (brief description):

- Coastal Protection Act (CPA) licence
- Food and Environmental Protection Act (FEPA) licence
- Environmental Protected Species (EPS) licence
- Town and Country Planning Act Planning Permission

Key Environmental issues:

Key issues considered in the Environmental Statement were:

- Seabed impacts (during construction)
- Wildlife Disturbance (during construction)
- Atmospheric Emissions (during construction)
- Fisheries impacts (during construction and operation)
- Navigational risks (during construction and operation)

All of the key environmental issues considered in the Environment statement were assessed as insignificant impacts.