ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person updating the form	Date submitted
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Project name: SURGE Waveroller

☐ Planned ☒ In Operation ☐Completed

Project description:

Project Developer: European Union

Technology Developer: AW Energy

Technology type: Oscillating water column

Resource (wave, tidal): Wave

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

Installed capacity (MW): 0.3 MW

Project Website: http://fp7-surge.com/

Launch Date: October 2009

Additional Description: SURGE (Simple Underwater Renewable Generation of Electricity) is a project founded by European Union. The project aims to access the WaveRoller device in a holistic manner and consequently, besides the performance, it includes an environmental program in order to evaluate some of the environmental impacts that it may have. It should be noted that these studies go beyond the legal requirements for the project implementation and they aim to proactively identify, target and address the potential impacts, both positive and negative, derived from the installation of the Waveroller device. Although the project ends in 2013 AW Energy will continue operation in the same site and environmental monitoring programs will go on also until the device has been decommissioned.

Location:

Ocean/Water body: Atlantic Ocean

Closest city: Peniche

Country: Portugal

Depth: 8-20 metres

Coordinates: 39.396825°, -9.35126°

Process status:

In 2011 an environmental incident assessment (also known as Appropriate Assessment) was made for this project because the site is in a Natura 2000 area. According to the Portuguese decree no. 225/2007 an Environmental Appropriate Assessment process has to be carried out for projects located within Natura 2000 sites, National Ecological Reserve sites or National Grid of Protected Areas. The study investigated Waveroller's possible environmental impacts and suggested mitigation actions. The main outcome was that WaveRoller's environmental impacts are less significant and they mainly take place in the installation phase. Later in the same year AW Energy obtained environmental license for the project after favorable conditional Environmental Impact Assessment decision (in Portuguese "Decisão de Incidências Ambientais favorável condicionada").

Construction of the devices took place in Finland and Portugal from early 2010 until mid-2012. The initial work was conducted in Finland, while the construction of the floating foundation, composite panels and full assembly of WaveRoller was executed locally in Peniche, Portugal.

WaveRoller was installed in August 2012 and has been in operation ever since. The SURGE project ended in October 2013 but the device will continue to be tested in the same site.

Licensing information (brief description):
The Environmental Incidence study was submitted to the regulatory authority, Comissão de Coordenação e Desenvolvimento Regional (CCDR) de Lisboa e Vale do Tejo in May 2011. In August 2011 AW Energy was awarded with environmental license. The license was originally for two years and AW Energy has requested to continue it.

Key Environmental issues:
The key environmental issues identified are underwater noise generation during operation and alterations on macro benthic communities and sediment movements. All these issues are in the environmental program of the project and they were addressed through monitoring.

Environmental webpage: http://fp7-surge.com/

Baseline studies and project effects studies: SURGE – WaveRoller				
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	Alterations to sediment transport and hydrodynamics.	Desk study.	WaveRoller's interference with broad sediment transport can be neglected. Local and temporary seabed sediments mobilization is possible due to mooring operations. The device doesn't cause erosion or induce changes in the current regime.	Completed
Benthos	Potential impacts to benthic communities.	Desk study.	In general it is expected that WaveRoller doesn't have a negative impact but the possibility of mortality of some fauna exists due to platform settlement on the seabed especially those with less mobility. However there's no presence of threatened species in the area.	Completed

			Presence of the device can cause a positive artificial reef effect of the submerged device equipment which could provide substratum for fauna aggregation.	
Fish and fisheries	Potential impact to fish and fisheries.	Desk study.	No significant effect is expected. Presence of the device can cause a positive artificial reef effect of the submerged device equipment which could provide substratum for fauna aggregation.	Completed
Large vertebrates	Potential impact to marine mammals.	Desk study.	No significant effect is expected. AW Energy is currently monitoring WaveRoller's impact to marine mammals.	Completed
Birds	Potential impact to birds.	Desk study.	No impact is expected except in the installation phase an impact is possible due to moving machines and noise. However this impact is considered small because there are lots of substitute habitat areas nearby.	Completed
Marine uses / users	Potential environmental impact to other marine users.	Desk study.	No predicted impacts.	Completed
Reports or Papers	Proposta de Definição do Âmbito Projecto WaveRoller Peniche made by Tterra – Engenharia e Ambiente Lda, 2011.			
Research Projects	N/A			

Monitoring and adaptive management: SURGE – Waveroller				
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	Environmental characterization of the site.	ADCP measurements, side scan sonar and multibeam surveys and sediment samples.	Assessment about WaveRoller's impact to sediment movements.	Baseline completed, monitoring underway
Benthos	WaveRoller's impact to benthic habitats.	Sediment samples, diver, photo and video surveys.	Identification and distribution of the species which live in the site and analysis of WaveRoller's impact on benthos in sediments	Baseline completed, monitoring underway

			and colonization on the surface of WaveRoller.	
Large vertebrates	WaveRoller's impact to marine mammals.	Visual observations and acoustic surveys.	Information about marine mammal's distribution in the site, analysis of how they utilize it and how WaveRoller affects their behaviour and occurrence.	Underway
Marine fauna	Acoustic underwater noise generated by WaveRoller.	Hydrophone survey.	Measurements and analysis of noise generated by WaveRoller.	Baseline completed, monitoring underway
Reports or Papers	N/A			
Research Projects	N/A			