



KVALSUND_ANDRITZ HYDRO HAMMERFEST

Name of person filing the form

Inger Lise Mathisen

Date submitted

04.07.2012

Project name: HS300 tidal device prototype Kvalsund

Project description:

Project Developer: ANDRITZ HYDRO Hammerfest

Technology type: Horizontal axis turbine

Resource: tidal current

Project scale (test site, prototype, array, commercial): prototype, tested at site

Installed capacity (MW): 0.3MW

Additional Description: HS300 was installed at site in 2003, and became the world's first tidal turbine of its kind to deliver electricity to grid in 2004. It was designed for a 3 years test period, and was retrieved after about 4 years of testing. All general components were in good shape, and the turbine was reinstalled in 2009 for further testing. HS300 has shown 98% availability during reliability testing. The tidal turbine will be retrieved in 2012.

ANDRITZ HYDRO Hammerfest selected Kvalsund in Northern Norway as test site for the Company's prototype HS300. This site was selected due to its current velocity, water depth as well sheltered location. The close proximity to Hammerfest with all relevant infrastructures makes it an ideal location for a full scale laboratory.

Project Website: <http://www.hammerfeststrom.com/research-and-development/testing/kvalsund/>

Location: The device is installed at 50m depth in Kvalsund, Finnmark, Norway.

Coordinates: not public

Process status:

Current status of the project implementation and future developments: The device has been through a complete deployment, operation, retrieval, maintenance and redeployment cycle, and has proven to be both efficient and reliable.

Expected operation date: Been in operation since 2003, grid connected since 2004.



Licensing information (brief description):

ANDRITZ HYDRO Hammerfest holds the consent to the site, given by the Norwegian Water Resource and Energy Directorate (NVE) for a 25 years period from 2001-2026. The trading license, hold by ANDRITZ HYDRO Hammerfest, was given in 2002 and need to be renewed every 4th year. The grid owner in the installation area is Hammerfest Energi AS.

Key Environmental issues:

A third party has been involved in the project since 2001. The chosen contractor has done several studies in the area earlier and has good knowledge of the location. The first study of the site was undertaken in 2001, before the prototype was installed at the site. The Company engaged the contractor to evaluate the site a second time when the HS300 turbine was retrieved for verification and again when it was redeployed at the site.

The EIA covered the potential impact the tidal turbine has on the business activities, outdoor life, marine life and seabirds, where it among other tests has been done a noise measurement. The EIA concluded that the HS300 turbine has no or insignificant impact on the studied areas.

Environmental webpage:

<http://www.hammerfeststrom.com/environment/kvalsund-eia/>

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	Water velocity study		Max velocity 2.5m/s	Done 1997
	Marine growth			Undertaken 2001
Benthos	Shore study	Which benthos is it close to shore and which algae and animals are typical for the area.	Not unique and is considered to have medium value.	Completed 2001, 2010
	Seabed survey	Used ROV to film the seabed and map under water conditions in the area	Gravel and stone. Not unique and is considered to have medium value.	Conducted in 2000
	Seabed survey, impact	Used ROV to film the seabed and map under water conditions in the area	No significant changes	Conducted 2007 and 2009
	Acoustical measurements of seabed	Acoustical measurements	Hard seabed (rock)	Completed 2000
Fish and fisheries	Potential impact on known species in the area	It's been looked at typical species for areas like Kvalsundet and their behaviour.	Turbine not creating significant changes.	Completed 2001, 2010
Large vertebrates	Potential impact on known species in the area		No or insignificant impact	Completed 2001, 2010
Birds	Species and behaviour in the area	Earlier studies was used as source for the study	Both diving and non-diving seabirds are seen in the area.	Two reports: 2001 and 2010.
Reports and papers	No reports and papers public available			

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)
Benthos	Shore study	Observation	Not unique and is considered to have medium value.	Undertaken 2001
Large vertebrates	Sea mammals	Observation		Undertaken 2008, 2009
Birds	Seabirds in the area	Observation		Undertaken 2008, 2009
Marine uses/users	Business and outdoor activities	Public meetings and discussions	No negative impact	Undertaken 2000
Other (can be named)	Water velocity	Measurements during operation	Detailed information on tidal velocity	Complete 2003-2007, 2009-2011
	Marine Growth	Measurements during retrieval of marine growth on blades	-	Done 2007
	Underwater sound measurements	Measure the radiated underwater noise from the turbine	Results give no concern.	Undertaken 2009
Reports and papers	- No reports and papers public available			