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Coordinates: 54°22′7.2″N 5°32′45.8″W

SeaGen

SeaGen was the world's first large scale commercial tidal stream generator.[1][2][3] It was four times more powerful than any other tidal stream generator in the world at the time of installation.[4]

The first SeaGen generator was installed in Strangford Narrows between Strangford and Portaferry in Northern Ireland, in April 2008 and was connected to the grid in July 2008.[5] It generates 1.2 MW for between 18 and 20 hours a day while the tides are forced in and out of Strangford Lough through the Narrows.[6] Strangford Lough was also the site of the very first known tide mill in the world, the Nendrum Monastery mill where remains dating from 787 have been excavated.

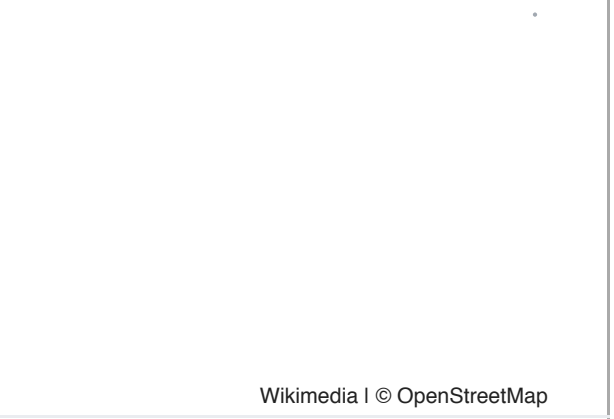
Contents

Background

Marine Current Turbines, the developer of SeaGen, demonstrated first prototype of tidal stream generator in 1994 with a 15 kilowatt system in Loch Linnhe, off the west coast of Scotland. In May 2003, the prototype for SeaGen, 'SeaFlow', was installed off the coast of Lynmouth, North Devon, England.[6] Seaflow was a single rotor turbine which generated

SeaGen

Commercial tidal stream generator — SeaGen — in Strangford Lough. The strong wake shows the power in the tidal current.



Country	Northern Ireland, United Kingdom
Location	Strangford Narrows between Strangford and Portaferry
Coordinates	54°22′7.2″N 5°32′45.8″W
Status	Operational
Commission date	April 2008
Decommission date	Spring 2017
Power generation	

300 kW but was not connected to the grid. SeaFlow was the world's first offshore tidal generator, and remained the world's largest until SeaGen was installed.[7]

Nameplate capacity	1.2 MW

Technology

SeaGen generator weighs 300 t (300 long tons).[3][8] each driving a generator through a gearbox like a hydro-electric or wind turbine. These turbines have a patented feature by which the rotor blades can be pitched through 180 degrees allowing them to operate in both flow directions – on ebb and flood tides. The company claims a capacity factor of 0.59 (average of the last 2000 hours). The power units of each system are mounted on arm-like extensions either side of a tubular steel monopile some 3 metres (9.8 ft) in diameter and the arms with the power units can be raised above the surface for safe and easy maintenance access.[1] The SeaGen was built at Belfast's Harland and Wolff's shipyards.[9]

The SeaGen rotors can be raised above the surface for maintenance.

Environmental impact

SeaGen has been licensed to operate over a period of 5 years, during which there will be a comprehensive environmental monitoring programme to determine the precise impact on the marine environment.[10]

SeaGen's predecessor, the 300 kW 'SeaFlow' turbine off the north coast of Devon

Problems

During the commissioning of the system a software error caused the blades of one of the turbines to be damaged. This left the turbine operating at half power until autumn 2008. The incident is being investigated and MCT is confident it will not happen again.[11] Full power operation was finally achieved on 18 Dec 2008.[12]

400 million gallons of water flow in and out of Strangford Lough twice a day.

History

The System was removed in 2017 [13], after Siemens sold the company and technology to rival Altantis Resources in 2015.[14]

References

1. Douglas, C.A.; Harrison, G.P.; Chick, J.P. (2008). "Life cycle assessment of the Seagen marine current turbine" (https://commerce.metapress.com/content/l2525g3001286200/resource-secured/?target=fulltext.pdf&sid=vwpwqjm0htfuvn45hmy4wf45&sh=journals.pepublishing.com) (PDF). *Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment*. Professional Engineering Publishing. **222** (1): 1–12. doi:10.1243/14750902JEME94 (https://doi.org/10.1243/14750902JEME94). Retrieved 2008-07-10.
2. "The rise of British sea power" (https://www.independent.co.uk/environment/green-living/the-rise-of-british-sea-power-799630.html). The Independent. 2008-03-23. Retrieved 2008-07-30.
3. Julian Rush (2008-03-31). "Power generation: the new wave" (http://www.channel4.com/news/articles/science_technology/power+generation+the+new+wave/1907547). Channel 4. Retrieved 2008-07-30.
4. Arthur Strain (2008-02-08). "Sea change for energy generation" (http://news.bbc.co.uk/1/hi/northern_ireland/7233829.stm). BBC. Retrieved 2008-07-10.
5. First connection to the grid (http://www.marineturbines.com/3/news/article/10/world_s_first_commercial_scale_tidal_power_system_feeds_electricity_to_the_national_grid__/)
6. Brittany Sauser (2008-07-29). "Tidal Power Comes to Market. A large-scale tidal-power unit has started up in Northern Ireland" (http://www.technologyreview.com/Energy/21142/). Technology Review Inc., Massachusetts Institute of Technology. Retrieved 2008-07-30.
7. "Case Studies for Schools: Tidal Power" (http://www.berr.gov.uk/energy/sources/renewables/schools/case-studies/tidal/page23016.html). Department for Business, Enterprise and Regulatory Reform. Retrieved 2008-07-10.
8. "World's first as £12m turbine installed in Strangford Lough" (http://www.belfasttelegraph.co.uk/news/environment/worlds-first-as-16312m-turbine-installed-). Belfast Telegraph. 2008-03-31. Retrieved 2008-07-30.
9. Henry McDonald (2008-03-31). "Tidal power comes to Northern Ireland" (https://www.theguardian.com/environment/2008/mar/31/tidal.power). Guardian. Retrieved 2008-07-30.
10. David G Erwin. "Environmental monitoring, liaison and consultation concerning the MCT Strangford Lough Turbine" (https://web.archive.org/web/20081011132433/http://www.all-energy.co.uk/UserFiles/File/2007DavidErwin.pdf) (PDF). Archived from the original (http://www.all-energy.co.uk/UserFiles/File/2007DavidErwin.pdf) (PDF) on 2008-10-11. Retrieved 2008-07-10.
11. "Delay in commissioning one of SeaGen's rotors" (http://www.marineturbines.com/3/news/article/11/delay_in_commissioning_one_of_seagen_s_rotors/). Marine Current Turbines. 2008-07-22. Retrieved 2008-07-30.
12. "Tidal energy system on full power" (http://news.bbc.co.uk/1/hi/northern_ireland/7790494.stm). BBC. 2008-12-18. Retrieved 2009-06-25.
13. "Strangford tidal energy turbine to be removed" (https://www.bbc.com/news/uk-northern-ireland-35416282). BBC. 2016-01-27. Retrieved 2017-06-25.
14. "Atlantis strikes deal to acquire marine energy tech company from Siemens" (http://www.hydroworld.com/articles/2015/05/atlantis-strikes-deal-to-acquire-marine-energy-tech-company-from-siemens.html). Hydro Review. 2015-05-01. Retrieved 2018-02-05.

External links

- Marine Current Turbines Ltd (http://www.marineturbines.com/).