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# ABB generators for first commercial wave power system

ABB generators are capturing power from the waves in the world's first commercial wave power generation project.

The ABB generators are one of the essential components of the Pelamis Wave Energy Converter, designed by Edinburgh based Ocean Power Delivery (OPD) Ltd. The first commercial wave farm project at Agucadora off the coast of Portugal will be operational during the coming months and will supply power for around 1,500 Portuguese homes.

The OPD Pelamis is a semi-submerged, articulated structure composed of cylindrical sections. Three of the sections are designed as power modules, with two ABB 125kW generators in each section. This allows for a high degree of fault tolerance and gives a total power output for the Pelamis of 750 kW.

Power modules are linked by hinged joints. The wave-induced motion of these joints is resisted by hydraulic rams, which pressurise the hydraulic system. Hydraulic motors are used in turn to drive the ABB electrical generators to produce electricity.

Power from all the joints is fed down a single umbilical cable to a junction on the sea bed. Several devices can be connected together and linked to shore through a single seabed cable.

ABB was selected because of its willingness to meet the needs of OPD. Steffi Anderson, Electrical Systems Engineer with OPD, says: "ABB came on board when our previous generator supplier could not meet our needs. We needed a generator with a high IP rating, IP 67 and ABB had a new sealing system it had designed for motors on the decks of ships. ABB provided a prototype generator at a low cost and was very keen to be part of the project."

Much of the ABB work was performed at the ABB motor plant in Vaasa, Finland.

ABB was also prepared to adapt its products to suit OPD's space constraints in the modules. It reduced the frame size of its generator from 315 to 280, cutting the weight from 860 kg to 725 kg. Says Anderson: "This was a great help because the lower frame size meant the generators were easier to install in the power modules, where space was at a premium." ABB also adapted its power connections, moving from a cable box to a system using flying leads in order to make it easier to connect the generator to the switchgear panel.

Derek Robinson, ABB's Production Manager for cast iron products, says: "Renewable energy is a major focus for ABB and we were glad of the chance to work with OPD to help them develop their wave energy generators. Our goal now is to help reduce the cost per kilowatt-hour by engineering out costs, improving efficiency and reducing sizes and stress."

Anderson added: "ABB were very easy to work with and were very willing to adapt their products to meet our needs. We envisage building larger versions of the wave energy converter that will use four power modules and so incorporate eight generators. We expect to have a number of projects underway in the near future, including sites in the Orkneys and in Cornwall, so ABB could be supplying us with as many as 40 generators for this new work."

ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in power grids, electrification products, industrial automation and robotics and motion, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalization with two clear value propositions: bringing electricity from any power plant to any plug and automating industries from natural resources to finished products. As title partner in ABB Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 147,000 employees. [www.abb.com](http://www.abb.com)



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**Caption:** ABB generators are capturing power from the waves in the world's first commercial wave power generation project.

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