Alstom Ocean

Stream turbine seals undergoing bench testing

Stream turbines must be reliable for long periods without human intervention. To ensure that, Alstom Ocean has tested a one-meter diameter seal.

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OUR CUSTOMER

Corporate name
Alstom Ocean

Activity
Design of tidal stream turbines for electric power generation

Workforce
50 employees

Alstom Ocean has plans for deploying a tidal stream turbine (18 metres in diameter, for a 1 MW power) on the raz Blanchard site, off the Cotentin Coasts. This machine is derived from the first prototype installed off Scotland by Tidal Generation Limited (TGL), a Rolls-Royce subsidiary specialising in tidal stream turbines acquired by Alstom Ocean in 2012.

Since tidal stream turbines are exposed to a hostile marine environment, they need to be perfectly reliable in order to avoid costly human operations. Thomas Robic, mechanical design engineer in Alstom Ocean, points out: "We are especially dedicated to improving the reliability of the one-meter diameter bearing seal which provides sealing between the rotating shaft and the fixed structure."

Simulating pressure changes

For that purpose, Alstom Ocean turned to SKF Economos which suggested appealing to Cetim. Cetim experts then worked in collaboration with these two partners to design a test bench with the capability to receive a large diameter seal and reproduce the real operating conditions, such as pressure changes generated by the swell, or the system's rotating speeds.

Two seals were subjected to bench testing for five months. The test campaign included endurance, reverse rotation, misalignment, overspeed and pressure change tests and made it possible to confirm the endurance of the tidal stream turbine bearing seals in their real service conditions, i.e. with phenomena such as a variable-amplitude swell.

Moreover, this campaign allowed to test the pressure compensation system which keeps a difference of pressure between the oil section and the water section, as this is an extremely critical feature for submerged systems.

The deployment of the tidal stream turbine is scheduled to take place in 2016.

Cetim's asset

Cetim designs, manufactures and installs test benches which are tailor-made to suit the specific requests of each customer. The test bench designed for Alstom Ocean and SKF Economos is now available for all industrial manufacturers that use this type of seals.

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