Case Studies for the Offshore Renewable Energy Industry

JDR Cable Systems Ltd

John Price, Technical Sales Manager

JDR Cable Systems' site at Littleport, Cambridgeshire is already in the energy business, producing umbilical products for the offshore oil and gas industry and its sub-sea field developments. The site functions as both heart and brain of the Umbilical Systems business, providing the necessary design, project management and manufacturing expertise.

JDR responded to the need for offshore wind developers to exert downward pressure on costs, in their case with respect to the medium-voltage cables they manufactured. Their innovation was to take some of the termination and installation aids they had developed for offshore oil and gas and apply them to wind farms, so reducing the very high cost of installation. It's a market that will represent a major area of development for the company in the future.

Peter Brotherhood Ltd

Peter Brotherhood is a 130 year old engineering company based in Peterborough whose traditional markets are mainly power stations petrochemical plants of various sizes around the world. The company dipped its toe in the water as a partner in wave energy research projects in 2002, which led to greater involvement in offshore renewables through a joint venture called Marine Energy Generation Ltd.

MEG is a joint venture between Peter Brotherhood and Tidal Hydraulic Generators Ltd (THGL) to target the marine energy market. The company is developing two new products called HydroAir and DeltaStream. HydroAir is a power generation system for use in Oscillating Water Column technology. DeltaStream is a free standing tidal generation device with a triangular shaped frame that supports three turbine nacelles.

Sea Pacific

Sea Pacific is a startup Australian company developing a wave power converter. This will sit on the sea bed to use wave energy directly to pump sea water to the shore, where it runs through a turbine to produce electricity, using existing generating technology. In addition, the system can deliver water to a reverse osmosis filter for the production of fresh water.

Those involved in the prototype design included companies experienced in other industries which adapted their expertise. A rubber manufacturer developed conveyor belt diaphragms that improved efficiency and a pump manufacturer developed a coating to withstand pumping sea water at high pressure.

Trident Energy Ltd

Image of HP Kelly available from suecrothers@renewableseast.org.uk (file size precludes inclusion here)

The founder of Trident Energy Ltd, Hugh-Peter Kelly, is also the inventor in the early 1980s of the Tubular Linear Motor / Generator – generating and controlling electricity in a straight line device rather than a rotary one. This is an internationally established product and was invented by him in the early 1980s for use in the automation industry. The technology has subsequently been applied in many other industries, and you will find it in products such as actuators in automatic doors and factory robots. There are over 32,000 motors of this type in use world wide and a further 15,000 actuators.

It was while experimenting with an early version of a linear generator that HP Kelly realised that it could be an ideal solution for the capture of sea wave power. An initial experiment was carried out, using a pre-prototype jig in the Atlantic off the north coast of Devon.

The experiment was immediately successful, and electricity was generated from the sea for the first time using this type of linear generator. It was immediately apparent that the concept had major technical advantages inasmuch that it removed the need for mechanical conversion mechanisms and hydraulics.

HP Kelly set up Trident Energy based at his factory in Southend to exploit this knowledge and the company is now building its sea demonstration device. The factory which previously had been making linear generators for other industries will be gearing up to produce them for the Trident system when it is in full production.