Wave&TidalEnergy NETWORK

COMMUNICATION HUB FOR THE WAVE & TIDAL ENERGY INDUSTRY

Spotlight on:
THE ISLE OF MAN

Wales Update

CABLE ROUTE PLANNING

Research & Innovation

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Delivering long term reliability

Considered cable route planning can de-risk installations and provide optimised long-term performance but cable failure in wave and tidal systems still occur. Cable failures are most common where the cable joins to the connector structure rather than in the connector or cable alone.

Scientific Management Associates' (SMA) thermoplastic moulding technology, applied for decades to critical defence projects, is now being utilised to solve these problems in the turbulent waters of tidal energy.

CONFLICTS

Many conflicts exist in determining cable specifications for tidal renewables: the often diametrically opposed requirements of robustness and flexibility and the selection of a jacket material that will survive the hostile environment for 25 years.

Electrical insulation can only be achieved by using polyethylene but this does not offer the toughness, impact, cut and wear resistance of thermoplastic polyurethane (TPPU).

SOLVING THE PROBLEM

SMA have decided that cable design shouldn't involve compromise and advocate the use of two jackets. Mechanically tough TPPU as the outer jacket while a polyethylene inner jacket provides exceptional insulation resistance and will last in excess of 25 years in sea water at elevated temperatures without degradation.

To eradicate the potential failure point at the cable and connector interface, specialist injection moulding processes are used to achieve chemical bonding to gland stems, connector shells, etc, whilst amalgamation of the jacket to the injected material retains all the strength and viscous elasticity without an adhesively based leak path.

Dual jacket sealing of both jackets creates independent seals meaning that even if the outer jacket is worn through, water will not leak into the cable or gland, critical for long-term reliability in the vibration and flow of tidal turbine environments.

Recent helium tests carried out on power export cable mouldings produced by the company not only met the requirements for water sealing but also passed the much more demanding sealing level for microbes.

COST EFFECTIVE

The dual jacket, dual sealing approach provides a cost effective alternative to any unplanned maintenance, reduction in generation efficiency or breakdown. With over 10,000 installations and zero leaks, this technology, at relatively low capital cost, is reducing lifetime operational expenses.

Scientific Management Associates