

# Wave @ Tidal

**ENERGY NETWORK**

Winter 2017 ISSUE 13 | £7.50

COMMUNICATION HUB FOR THE **WAVE & TIDAL ENERGY** INDUSTRY

## FOCUS ON IRELAND

CONTINUING INDUSTRY LEADER

## CABLE HARNESSES

SAFETY FIRST

## SITE SELECTION & PLANNING

FUTURE PROOFING

Image courtesy of: Fundy Force







# 0.5% INCREASE IN BUDGET COULD ELIMINATE 100% OF INSURANCE LOSSES

Scientific Management International, the only manufacturer in the world to hold 20 years of continuous Ministry of Defence capability approval for the supply of through hull penetrators for nuclear submarines, have calculated an increase in overall project cost of cable systems from only 10% to 10.5% should extinguish cable system failures completely

With a 25 year heritage in submarines, the same technology is now being transferred to solve the challenges of cable losses in marine, aerospace, transport and pertinently energy where average downtime for cable losses exceeds 100 days.

## REPORT FINDINGS

A report following a year-long detailed investigation by broking and risk specialist Genillard & Co reported 90 subsea cable losses over the last seven years, with a total value in excess of €350 million in insurance claims alone!

This report, based on industry information and a series of 1-2-1 interviews with



Gland for power

leading stakeholders in the wind insurance sector, found that whilst subsea cable incidents typically account for 80% of global offshore windfarm insurance losses they represent only 10% of the capital cost.

A 2017 report concerning UK windfarms by the Offshore Wind Programme Board found that the average repair cost from publically disclosed cable repair costs was £12.5 million or to put it another way it's costing £170,000 for every km of high voltage export cable currently in service.

Making the right connection with your cable harnesses will result in right first time, fit and forget operational performance.

## WHAT IS A CABLE HARNESS?

Typically cable harnesses for subsea installations are constructed with either connector terminations, gland terminations or combinations of both.

Whilst connector options offer the ability for modular build and installation methodology, gland options offer a potentially lower cost solution to a connector, the trade-off being reduced modular build and installation capability.

The material choice also plays a key role in the success of the harness once it has been installed. Wrong material choice, or poor cable design, can lead to corrosion

issues, fatigue failures or excessive weight, causing strain on the supporting structure. This is why it is important to involve manufacturers of cable harness systems as early as possible in the design process, such as Scientific Management International, to avoid the issues detailed above.

They encourage their engineers to explore leading edge technologies, cross fertilising skill sets from marine, aerospace, transport and energy sectors, drawing on a 25 year history rooted in the design and manufacturer of cable harness sets mounted outboard in the extreme hostile environment of nuclear submarines.

This ability to take into account a variety of technologies available is key to the overall success of the delivered product and its influence on the overall system. In applications where there are many options available, engineers are encouraged to choose the design parameters that best fit the system requirements, considering the environment in which it will be deployed. Many issues are considered including cathodic delamination, cable life and its application, not just the quickest or cheapest option – seeking to provide lowest lifetime cost through absolute reliability.

## NOT SO EYE WATERING

Like an onion, cable harness design relies on many layers. Research backed experience confirms single layer cable jackets are more vulnerable to installation and operational damage which results in failures once deployed. This leads to costly remediation and greatly increases the through life cost of a system.

Cable jacket selection has historically required a compromise between electrical performance and abrasion resistance. Here, Scientific Management Internationals heritage resulted in development of technologies that enable Clients to enjoy the benefits of both Polyurethane and Polyethylene.

The inner sheath can be designed for maximum insulation resistance whilst



Connector harness with an angled termination and non-metallic connector parts for the cathodic protection

the outer sheath utilises enhanced abrasion resistance materials. Produced to the very highest engineering and quality standards as used on submarine products around the globe this technology has resulted in Ministry of Defence certification for over 20 years continuously.

## REAL TIME, LIVE MONITORING

The technology now exists to ensure uninterrupted power and signal transmission, whilst supporting live monitoring of tidal and wave systems. Advanced fibre optic connectors address the spatial challenges and can deliver the intelligence from Fiber Bragg Grating based sensor systems.

Real time, accurate information of the in-service loads are of great importance both for optimising design, quantifying fatigue loading of blades and bearings, but also for long-term structural health monitoring.

Meanwhile sensors embedded into the moulding can provide an early indication of declining electrical insulation resistance, particularly important when deploying hygroscopic Polyurethane jacketed cables in warmer waters.

This vital performance data can be used to support the introduction of 'on condition maintenance', planned and accounting for the restricted access associated with seasonality, tides and weather. Accessing and maintaining a turbine ahead of a failure provides long-term operability and enhanced profitability.

## FEEDBACK, NOT DOWNTIME

Real time, live monitoring delivers cable systems capable of ongoing performance feedback, where Scientific Management International know-how in long term reliability globally on submarines and surface vessels for nearly three decades with zero leaks comes into play.

For as a little as 0.5% increase in up-front investment, operational reliability can remove 80% of historic reliability problems.

Scientific Management International

