Subsea Cables Conference

Tuesday 17th July 2018
National Oceanography Centre
University of Southampton Waterfront Campus
European Way
Southampton
SO14 3ZH
Neil initially studied business in Aberdeen then trained as a commercial diver spending eight years carrying out numerous diving assignments in the UK and Norwegian waters involving new construction projects, pipeline surveys, welding and inspection. He has over 25 years' management experience in director and business development roles, combined with over 15 years in the subsea industry.

Prior to joining Subsea UK, he spent four years managing the National Hyperbaric Centre which included project-managing saturation diving operations and hyperbaric weld trials. He more recently developed the subsea safety training and consultancy aspect of the business, where he regularly lectured to subsea engineers and delivered a range of training courses both in the UK and overseas.

He has experience working in India, Middle-east, Africa and Brazil and has worked with the Oil and Gas Producers diving operations sub-committee on client representative training and competency for subsea projects. He was also an active member of the IMCA diving safety, medical, technical and training committee.

In his diverse career, Chris led a team providing computer integration services to manufacturing businesses, led as Sales and Marketing Director to the IT sector servicing international corporations, before moving into the Oil, Gas and Renewables Sectors.

His roles have included Operations Director, VP Management Information Systems, HR Director and QHSE Director. Chris has overseen the development of 4C Offshore from a provider of specialised marine advisers and owner engineers to Submarine electricity cable project owners, to one where it has also become the market leading intelligence service to the global offshore wind, electricity Interconnector, port and shipping markets.
Challenges in Offshore Cable Route Surveying from the Marine Consultant’s Perspective

Traditional approaches for finite element modelling of inter-array cables spanning from the seabed to cable entry on turbine foundations is generally a simplistic approach neglecting individual component responses by using equivalent mechanical properties for the cable and ancillary protection. Additionally, onerous service conditions are often introduced to mitigate against cable vortex induced vibration (VIV) resulting in narrow service windows in mobile seabed and scour zones which can be relaxed by advanced modelling techniques.

Advanced finite element analysis modelling with explicit modelling of cable, cable entry and protection system components provides a more realistic and accurate representation of the cable spans, allowing relative axial movement and gap modelling between components. This approach is shown to significantly reduce conservatism in comparison with traditional modelling approaches. This is presented via a case study demonstrating how through advanced finite element modelling a system can be demonstrated to be acceptable which would be unable to meet manufacturers requirements through traditional techniques.

Advanced modelling is also shown to provide an ability to relax freespan criteria with respect to VIV. Rather than adopting onerous criteria to negate VIV onset, accepting cable vibration and managing the fatigue accumulation within defined limits can increase the acceptable span length, hence mitigating intervention requirements. This is achieved through advanced finite element analysis of the span geometry, cable cross-section and lifecycle metocean discretisation. Modelling the cable response to the environment and the subsequent cable component loadings allows a cumulative fatigue assessment from wave and vibration loadings to be performed and iterated to find acceptable span lengths.

In summary, the advanced modelling of inter-array cable systems provides more realistic loading regimes, reducing conservatism in cable loadings through cable entry systems and relaxation of allowable span lengths to reduce intervention requirements.

(Bio and pic for Ian Osborne)

10:35 Challenges in Offshore Cable Route Surveying from the Marine Consultant’s Perspective

11:00 – 11:30 Break
Cable Burial in Subsea Cables

Learning from experience – Canyon Offshore, to date, has been involved with burial of both inter array and export cables on over 20 offshore wind farms within most European waters. Canyon has also been involved with the burial of inter country interconnectors associated with the sharing of electrical power between different countries and is planned to work on another 2 interconnector projects over the next 3 years.

Cables are not just associated with renewables and power sharing and Canyon has buried a number of power from shore cable projects for O&G sector both in Europe and in the Middle East.

This presentation will give some of the lessons learnt having worked with our clients and their clients to make each a successful project as well as present some of the innovation and investment made by Canyon for future cost reduction as well as meeting burial depth obligations.

John has been an Engineer within the Subsea, ROV industry for over 25 years. Initially working with the UK and overseas navies on remote control mine countermeasure ROVs and then for the past 17 years on the ROVs, Ploughs and trenchers used to support offshore oil and gas, submarine telecom and power cable installation. John has had a diverse career from working offshore, through to operations management, business development and now as director of seabed intervention for Canyon Offshore Ltd.

As Director Seabed Intervention, John is responsible for working with the senior management team to support the business’s strategy in taking its assets and services; supporting all things energy. John is responsible for building relationships with current clients and strategic partners primarily in the North Sea and EMEA region - although his remit, just like the company’s equipment and services - extends worldwide. John’s expertise in the renewables sector and the trenching market merges with the core strength of Canyon Offshore, which is providing services (ROV, Trenching, construction support and vessels) in shallow to deep water marine contracting operations, and allows him to advise global energy, renewables and telecom players on the most cost-effective solution for their project needs.
11:55  **New Subsea Cable Insulation Monitor for Detection up to 10GΩ.**

The need to understand and detect early insulation breakdown in subsea cables is a must for operators and maintenance teams. Bender has been supplying LIM’s to this sector for decades and will present case studies of installed devices and run through some reasoning behind the install.

As a broader overview The Bender Group are looking for SMART partners in which to develop new technology and build on over 70 years’ experience in earth fault monitoring for subsea and offshore users.

*Phil Robinson works as a Business Manager at Bender UK Ltd. He currently leads the Oil & Gas sector for the UK.*

*His focus is on delivering new concepts to the market to improve electrical safety, protection and availability through advanced condition monitoring.*

*Subsea applications include umbilical’s, subsea pumps and ROVs etc.*

12:20 – 13:30  **Lunch**

13:30  **Reducing Operating Costs Through Automated Fault Response and Realtime Condition Monitoring in Power Cables**

Disproportionately high insurance claims and operational costs come from failures of cables used in all offshore wind arrays. As the industry moves to larger turbines and 66kv cables, the risk and cost of failures only increases, yet operators are still working without realtime visibility of electrical performance – the key parameters for failure prevention, avoidance and ultimately the best way to improve productivity. This lack of visibility and control is due to the prohibitive size, cost and complexity of traditional instrumentation systems required to protect, monitor or control key HV assets like cables, turbines and their terminations.

Synaptec have just launched a new technology to address this, using a patented distributed photonic sensing technique to make sensors small enough to fit in the palm of your hand, completely passive, GPS and datacomms-free and using the cables themselves to provide the communications network required. Our first-generation products save O&M costs by detecting faults at least 10X faster and automating the response to save days outage, human O&M response and asset damage. The second generation of products will also offer condition monitoring services for dynamic line rating, impedance to fault and power quality functions to safely optimise usage of export cables and termination without exceeding design parameters.

*Saul brings 25 years of sales and marketing experience, having led growth for start-up and established brands in the IT, mobile, unified communications and most recently semiconductor industries in every major global market.*
The power transfer performance of HV cables (both ORE inter-array and export cables and interconnectors) is limited by the ability of a cable to dissipate heat, which in turn is controlled by the medium in which the cable is buried. Therefore an understanding of the thermal properties of the burial environment plays a primary role in: cable rating, the lifetime performance of the cable; and the lifetime monitoring of the cable for burial and exposure through the analysis of DTS data. Ultimately the ability to properly understand and potentially control the mode of heat dissipation in space and time could reduce both the CAPEX and running costs of a major interconnector.

Recent work by the research team at Southampton (Hughes et al 2015 a and b; Emeana et al 2016; Dix et al., 2017) has used both numerical and physical modelling approaches to demonstrate that, in typical seabed sediments, heat dissipation from HV cables is controlled by both convection and conduction and that the degree of conduction vs convection is controlled primarily by the permeability of the sediment. Further, we have been able to provide initial models of the impact of: over-burial; exposure; trenching and heterogeneous sediment stratigraphy on the mode of heat dissipation. We are now undertaking analysis of DTS data combined with geological ground models to test these results in deployed cable systems.

Justin Dix is the Head of the Geology and Geophysics Research Group, within Ocean and Earth Science, at the University of Southampton. His research focuses on high-resolution geophysical and geological techniques to answer a series of applied research topics including structure seabed interactions. His particular expertise is in the acquisition, processing and analysis of high resolution acoustic data (swath bathymetry and sub-bottom data), including the development and application of the 3D Chirp system for decimetric sub-surface imaging of the top 20 m’s of the seabed, and the integration of these with core and geotechnical data to generate 4D ground models. A current research focus is substrate controls on the modes and rate of heat dissipation from underwater HV cables.
The European Subsea Cables Association (ESCA) and the Important Role that ESCA Plays in Support of Subsea Cables

An introduction to ESCA and its history.
ESCA liaison activities with Government and non-government agencies.
An overview of the Sub-groups within ESCA.
An overview of the operational guidelines that ESCA have composed for the benefit of the subsea cables sector.

Protection of cables comes in many forms: ESCA fishing liaison and KISORCA.

Antony Zymelka is a very well known cable focused professional who has amassed around 40 years of experience in the Subsea Cable industry. He has been involved in approaching 200 Subsea Cable projects worldwide.

Antony was qualified by Pirelli (now Prysmian) in the Design of Super Tension Power Cable Accessories and the Installation, Testing, Commissioning, Fault Location and analysis of SCFF, MIND and Elastomeric (XLPE, EPR etc) Super Tension AC and DC Power Cables.

Having spent many years Offshore on various Cable Ships, and Onshore in Design, Engineering and Project / Senior Management, his Subsea Cable Installation Operations, Installation Engineering and Offshore and Onshore Management experience is extensive. This experience encompasses Power, Telecommunication, Umbilical, Military and Scientific Cables.

Antony is considered by many as being a leading authority on Subsea Cables and sits on the executive committee of the European Subsea Cables Association (ESCA). He also chairs the ESCA Renewables and Power Cable Sub-Group composing various industry guidelines including: Proximity, Subsea Power Cable Installation and Repair. Antony is also an active member of CIGRE and participates on various CIGRE Technical Working Groups.

Recently, Antony has had the pleasure to accept a Directorship at BPP Cables where his expertise is being applied across many projects. BPP Cables being unique in their cables focussed technical capabilities including design, is considered to be at the forefront of providing INDEPENDENT cabling solutions.