Subsea Cables Conference

Tuesday 18th September 2018
Central London
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.
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.
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.
New Subsea Cable Insulation Monitor for Detection up to 10GΩ. (speaker TBC)

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.*

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.*
13:55 3D Chirp More than just Cable Detection – Insights in to the Trenching Process
(speaker TBC)

The life time performance of HV cables (both ORE inter-array and export cables and interconnectors) is limited by the physical properties of the sediment in which the cable is buried. The burial material and burial depth has implications for both heat dissipation from the cable (this in turn plays a primary role in cable rating and the full-lifetime cable operation and maintenance) and its stability within the seabed (i.e. its potential for exposure or over burial). Our understanding of the key physical parameters of the sediment (e.g. grain size, porosity, permeability, thermal conductivity and relative density) are based on measurements of the ambient condition and take no account of physical property changes during the trenching process. We provide initial results from high resolution 3D acoustic imaging of trenched cables in different substrates and their implications for both the trenching process and the subsequent operation of the cables.

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.

14:20 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.

14:45 – 15:00  Break

15:00  Monitoring the Dynamic Seafloor: Using Emerging Technologies to Understand the Threats Posed by Marine Geohazards (speaker TBC)

Seafloor networks of cables, pipelines, and other infrastructure underpin our daily lives, providing communication links, information, and energy supplies. Despite their global importance, these networks are vulnerable to damage by a number of natural seafloor hazards, including submarine landslides and turbidity currents. Conventional geophysical techniques, such as high-resolution reflection seismic and side-scan sonar, are commonly employed in geohazard assessments. These conventional tools provide essential information for route planning and design; however, such surveys provide only indirect evidence of past processes and do not observe or measure the geohazard itself. As such, many numerical-based impact models lack field-scale calibration, and much uncertainty exists about the triggers, nature, and frequency of deep-water geohazards. Recent advances in technology now enable a step change in their understanding through direct monitoring. We outline how emerging monitoring tools can quantify key parameters for deepwater geohazard assessment. Repeat seafloor surveys in dynamic areas show that solely relying on evidence from past deposits can lead to an under-representation of the geohazard events. Acoustic Doppler current profiling provides new insights into the structure of turbidity currents, whereas instrumented mobile sensors record the nature of movement at the base of those flows for the first time. Existing and bespoke cabled networks enable high bandwidth, low power, and distributed measurements of parameters such as strain across large areas of seafloor. These techniques provide valuable new measurements that will improve geohazard assessments and should be deployed in a complementary manner alongside conventional geophysical tools.

Dr Mike Clare
National Oceanography Centre
Dr Mike Clare leads the Geohazards and Marine Sedimentology Research Group at the National Oceanography Centre. His research is focused on better understanding seafloor hazards by integrating traditional observational techniques, novel statistical and numerical modelling, and direct monitoring of active systems using emerging technologies. He is currently a NERC Knowledge Exchange Fellow under the Environmental Risks to Infrastructure Innovation programme, as part of which he has provided advice on seafloor hazards to the International Cable Protection Committee. He formerly worked for ten years as a geohazard consultant to offshore industries for ten years, having led Fugro’s UK Engineering Geology and Geohazard Team. He maintains a collaborative link with oil and gas, renewables and telecommunications industries.

15:25 Improved Assessments of Cable Stability and Integrity on Rocky Seabeds (speaker TBC)

This presentation describes recent research into the behaviour of cables on rocky seabeds with a focus on improving predictions of stability and integrity. The work spans cable-fluid and cable-seabed interactions. We show how the cable-scale seabed ruggedness has a major beneficial influence on the hydrodynamic loading and seabed friction. Lab scale model tests and numerical CFD analyses are used to explore these factors individually, and calibrate improved design methods. The overall modelling approach is then benchmarked against observations of operating cables in the Pentland Firth. It is shown that the new approach is more realistic than prevailing design code methods, which significantly underestimate the cable stability. This research therefore provides an improved basis for modelling the stability and through-life integrity of subsea cables on rocky seabeds.

Dave is Professor of Infrastructure Geotechnics at the University of Southampton, involved in the development of the UK:CRIC National Infrastructure Laboratory. He previously held the Shell Chair of Offshore Engineering a the University of Western Australia, and was the Director of the ARC Research Hub for Offshore Floating Facilities (offshorehub.edu.au). His research is focussed on geotechnics, cable and pipelines design and the broader theme of offshore engineering, primarily for energy developments. He is a Co-Director of the EPSRC Offshore Renewable Energy Supergen Hub.

15:50 Close