

Life of Field Conference

6th November 2018

Doubletree by Hilton Hotel

Bristol



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09:30 Registration

10:00 Welcome

10:10 Back to the Future: 'what technologies have already been used or proposed that the subsea sector has forgotten and could be significant in the current cost sensitive era'



Steve Sasanow
Managing Director
Knighton
Enterprises Ltd

Since the advent of the subsea sector in the early 1980's, operators and engineering companies have spent considerable amounts of time and money trying to find ways to reduce the cost of subsea developments. In the early period of shall water fields, it was in order to compete with existing concepts. As projects moved into deeper waters and development solutions became more complex and expensive, field developers went looking for more cost-effective answers. But has the industry already used or proposed concepts and techniques that could be deployed again? Let's scratch our heads and find out.

Steve Sasanow (67) was associated with Subsea Engineering News, the only industry newsletter dedicated to subsea production, deepwater technology and underwater engineering, for 31 years. He was founding editor in 1984 before acquiring the newsletter and becoming publisher as well in 1987. He continued in the dual roles until 2013 when SEN was sold to Hart Energy and continued as editor until 2015. In addition to his journalism which included specialist technical writing for most major oilfield magazine plus several British daily newspapers, Steve has done extensive consultancy work for major operators and contractors in the offshore industry and run technical conferences and seminars and subsea engineering training courses. Most recently he served on one of the technology review committees for the Oil & Gas Technology Centre. He has a Master's in journalism from Boston University's School of Public Communication – but that was a long time ago!

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10:35 Control System Sustainability, Obsolescence Management & Performance Monitoring, the foundation for life of field



Roger White
Brownfield
Technical Support
Manager
BHGE

For many years, Baker Hughes, a GE Company, has successfully implemented a full integrated Asset Sustainability Program in which its Obsolescence Management Program, compliant with ISO 62402 guidelines, provides a central pillar.

The Sustainability Program draws on over 10 years' experience of supporting a broad base of global customers, ranging from NOC's and super-majors to independent operators

The program, which has its roots in a process originally developed to address obsolescence of commercial electronic components, has continually evolved and developed to include not only electronics hardware from a system and component level, but also embedded or third party supplied software components including computer operating systems and HMI applications. The process also encapsulates the need for backward compatibility of new product platforms as they are introduced, to overcome obsolescence of legacy component parts and subsystems whilst inherently providing improved system performance.

Continued evolution of the Sustainability Program and its underlying Obsolescence Management component includes the addition of Statistical Performance Analysis and Remote Monitoring & Diagnostics, enabled through the utilisation of the Baker Hughes Digital Tool Kit. These elements combined potentially alleviates the frequency of equipment inspections, optimises spares holdings and provides a predictive mechanism to minimise equipment repair cycles.

Roger commenced his professional career in the defence industry, initially with Rolls Royce as a Student Apprentice and later as a post graduate with British Aerospace and Plessey Naval Systems. This period provided a breadth of experience ranging from aero engine manufacture through to missile system performance and naval vessel noise signature mitigation. With 8 years of defence industry experience he transitioned into the subsea oil and gas Industry where he has spent over 25 years. During this period, he has undertaken numerous roles, including 8 years with ABB Offshore Systems where his final position was Sales Manager responsible for Subsea Production Controls Business Development in Houston. He also spent 2 years as Sales & Marketing Manager for Aker Kvaerner in Aberdeen responsible for Subsea Production Controls, XTs and Umbilicals. Prior to joining Baker Hughes, Roger held the position of Vice President of Business Development for the Eastern Hemisphere with Teledyne Oil & Gas for 9 years.

Currently employed by Baker Hughes, he has held the positions of Global Sales Manager for Brownfield Solutions and most recently Brownfield Solutions Leader for the Integrated Services Solutions business area.

He holds an MSc in Applied Mechanics from Cranfield University, an MA in Marketing and DMS from Bristol Business School and is also a Chartered Engineer and Member of the IMechE.

11:00 Tea & Coffee Break

11:30 The consequences of electrical insulation failures in aging umbilical's: copper loss and hydrogen generation

Degradation of insulation resistance in subsea cables, connectors, and umbilicals is an industry problem on a global basis. Most subsea power delivery systems utilise a 'floating earth' supply and with such systems, it is mandatory that an Insulation Monitoring Device (IMD) is used to verify the integrity of the insulation resistance. The presentation will present the fundamental processes that occur with sea water in contact with the copper conductors of a cable when an IMD is used and further considers what happens when a similarly wetted cable with two or more insulation faults is energized with an electrical supply.

The paper will show that degradation of the cable's conductor insulation in sea water environment will lead to serious and potentially catastrophic damage of the copper conductors. The theory, also supported by practical testing, will also show that the applied voltage from the surface power supply and/or from a standard IMD will also result in the generation of hydrogen gas within the cable or umbilical.

The theory and practical test results show how, if low insulation resistance is left unaddressed, the electrical distribution system will be severely compromised and the original design life will not be achieved.

Neil Douglas has been in the Subsea Controls Industry for over 30 years, the majority of which were spent with what is now BHGE. In 2007, along with co-director Max Nodder, he established Viper Subsea (since renamed Viper Innovations), a company that specialises in technology development and integrity management of subsea controls and electrical distribution equipment.

Neil holds a Bachelor of Science degree in electrical and electronic engineering and a Masters in Subsea Engineering. He is also a board member of the West of England Local Enterprise Partnership and sits on the North Somerset Growth Board.



Neil Douglas
Managing Director
Viper Innovations Ltd

11:55 Lowering Life of Field OPEX by Lowering the Cost of Subsea Intervention Operations – Including P&A Operations



Matt Readman
Technical Director
Secc Oil & Gas

Secc's simple Plug and Play, Emergency Quick Disconnect (EQD) and Quick Connect Disconnect Coupling (QCDC) technology is delivering significant life of field OPEX savings by lowering the cost of subsea intervention operations (including P & A operations). Secc's technology provides cost effect insurance against life of filed flow assurance issues.

In a "lower for longer" environment, operators are calling for more technological innovation to allow progress in the rigless intervention market. They are looking to reduce cost and complexity and increase efficiency.

At the heart of the matter is the practical issue of accessing subsea wells more easily and intelligently, particularly in more complex and expensive environments – namely subsea and deep water.

Secc's Hot Make Hot Break (HMHB) connector provides operators with the best available, safest, and most cost-effective technology to access subsea wells from a range of subsea production assets including manifolds, PLEMs, PLETs, and subsea trees. The Hot Make Hot Break EQD provides a reconnectable, self-sealing weak link that breaks during vessel drift off.

Secc's plug and play technology is demonstrating how considerable operational savings can be made using fit-for-purpose technology and removing the need to commission light well intervention vessels, rigs, drillships, or vessels equipped with diver spreads.

Operators and service companies are able to right size and deliver fit-for-purpose operations, reducing the need for unnecessary equipment, thus also reducing rates. The simple plug and play functionality is reducing Non-Productive Time (NPT) and speeding up operations. As such, operators are making significant CAPEX and OPEX savings by simplifying their approach to well interventions and P & A work.

SECC's technology has been successfully utilized in the North Sea to deliver 7 figure sum savings.

Matt was apprenticed in 1972 as a mechanical engineer at Sir Farmer-Norton in Manchester, specialising in structures and applied mechanics. He then moved to a technical specialist research position at University of Manchester Institute of Science & Technology (UMIST) specialising in loading conditions of composite structures for the Ministry of Defence. Matt won the Burdikin Shield for his unique hoop tension test. Matt registered his first patent in 1993 at UMIST. The device was a grab ring which enables push together technology for steel pipes with the ability to carry very high loads.

Matt then developed and patented a polyethylene coupling (Readman Fitting) for the water and gas industry. This was then sold to Tricorn plc in 1998 to become the standard water and gas barrier pipe fitting for all UK service pipes. Matt continued to successfully develop profitable products for UMIST before joint forming Secc Oil & Gas Ltd in 2004.

As the Technical Director and Inventor at Secc, Matt has been applying his extensive experience and success in connector technology to the oil & gas subsea industry. Matt is responsible for leading the development of Secc's portfolio of technical IP.

12:20 The use of Mechanical Connectors throughout Life of Field

During the life of a pipeline a number of repairs and modifications may need to occur to optimize the use of the pipeline. In the current climate there is a greater demand for optimizations and savings and more opportunities for cooperation between operators. The move towards decommissioning of aging assets and associated costs combined with new exploration in other areas means that opportunities to re-use existing infrastructure are increasingly attractive financially and environmentally.

Cutting of the pipeline to affect a tie-in or bypass whilst being the most intrusive type of intervention does offer opportunities to ensure the modified system is approaching ideal state and associated risks are managed. Production demands that operations involving cutting a pipeline linked to a producing asset are executed in an optimized time frame to minimize production impact. Where an operation can be planned in advance steps can be taken to mitigate risks of delay and ensure performance.

The presentation will examine the use of the use of mechanical connectors in planned operations using examples to illustrate tie-in and bypass applications. The use of mechanical connectors will be compared with other available methods used in these type of pipeline interventions such as welding.

Andrew Woodward is an experienced technical sales professional with a focus on engineered solutions for onshore, offshore and subsea pipeline applications. He has been Subsea Sales Engineer at Hydratight UK for over 2 years with focus on pipeline integrity solutions for a global client base, providing technical, commercial and contractual support for Mechanical Connector, Clamp and remote operated repair solutions. During this time he has worked with major operators in Europe, Middle East, North Africa and India on a variety of pipeline interventions including bypasses, tie-ins and repairs. Andrew has also been heavily involved with New Product Development initiatives to optimise Mechanical Connector solutions.

Prior to working at Hydratight he spent 6 years as Technical Sales Engineer in the UK and Middle East working primarily with ports, shipyards and heavy industry with a focus on Middle East and Indian Sub-Continent regions. Andrew holds BEng (Hons)



Andrew Woodward
Subsea Sales
Engineer
Hydratight

and MSc qualifications in Mechanical Engineering from Aston University where he participated in the Formula Student programme over 3 years.

12:45 Lunch

13:45 ASPIRE for Integrity Management Support for Upstream Assets



Payam Jamshidi
TWI UK Ltd

This paper focuses on the ASPIRE program that has been developed to support the integrity management for upstream assets. ASPIRE stands for “Assessment Strategy for Upstream Plant Inspection and Repair”.

ASPIRE aims at delivering results to the Operators in terms of risk as the product of probability and consequence of failure as well as providing inspection recommendations based on the strength response of the corroded assets. These mitigation actions will determine the acceptability of the asset to remain in service within the acceptable risk. Through this comprehensive approach to structural integrity assessment, the operator’s cost for inspection will be substantially reduced.

The four components of the ASPIRE program will be presented in detail:

- Risk-based Inspection (RBI) for the identification of high risk scenarios by reviewing active/potential damage mechanisms and the suitability of mitigation methods so that inspection/maintenance resources are optimised. This is achieved through a software package that uses the fundamental of probabilistic approach which not only assess the risk but also outputs a risk-focused inspection and maintenance plan in an auditable and highly user-oriented format
- Total Quality Inspection (TQI) covers the following:
 - o selection of the most appropriate NDT technique
 - o qualification of equipment, procedures and inspection personnel
 - o data recording & interpretation
- Fitness for Service (FFS) for a detailed assessment of flaws using built-in Finite Element Analysis (FEA) capabilities to evaluate complicated geometries and loadings.
- Optimum Repair Technologies (ORT) provide Operators with the means to establish the most cost-effective approach to reclaiming a damaged component.

ASPIRE is a collaboration between TWI which is one of Europe’s largest independent research and technology organisations and Innospection which is a provider of advanced and innovative inspection services and solutions for the integrity assessment support of splash zone and subsea assets in the oil and gas industry.

Payam Jamshidi joined TWI in 2003 as a Chartered Engineer and is currently the team manager for the asset integrity management section. His main area of work is on Risk Based Inspection (RBI,) and reliability assessment of oil and gas assets operating in offshore or onshore environments. Payam is also product leader for TWI’s Risk-Based



Sebastian Hartmann
Business
Development &
Sales Manager
Innospection Ltd

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Inspection (RBI) software RiskWISE®. Prior to working for TWI, Payam obtained his PhD at University of London, in Materials Science and Engineering. He also held the role of Chief Technical Officer for the National Composites Certification and Evaluation Facility (NCCEF).

Sebastian Hartmann started as a Pipeline Engineer in pipeline construction. In 2000, he joined PII Pipeline Solutions as a Sales Support Engineer analysing clients' requirements for internal non-destructive testing of pipelines in the oil and gas industry. In 2005, Sebastian started with NDT Systems & Services as a Sales Manager and the main field of activity was associated with inline inspection solutions for the offshore industry including high pressure tools for deep water applications. In 2013, he became a Sales and Business Development Manager at Innospection Ltd., and is responsible for developing the subsea and pipeline inspection business activities further.

14:10 Live 3D Vision – a ground breaking new subsea technology



Brian Allen
CEO
Rovco

Unlike many underwater scanning systems, Live 3D vision unlocks the potential for scaled, true colour models of subsea infrastructure with millimetre accuracy. Based on high quality video survey data, it is low risk, using familiar operational methods and equipment. This talk will look forward from current processed 3D approaches to the future live 3D enables, presenting some of Rovco's R&D work. Why have video when you can have a mm perfect, 3D engineers CAD model in full colour for the same price?

3D improves the quality of inspections, which in turn provides a better means of communicating this information and finding the right solution. Easily viewed and measured online, Rovco's 3D models provide a shareable, common view of assets in seconds. 3D enables key metrics such as the distance between structure points, surface area and volume calculations, and the ability to compare past and present models to determine areas of change. Our 3D systems are being developed to deliver results in near real-time generating cost savings of up to 80% compared with traditional survey methods.

At Rovco we believe that the demand for 3D and Artificial Intelligence solutions will increase in line with the growing need for accurate data for critical analysis - it is a huge breakthrough for the industry as a means to identify, diagnose, and provide solutions for underwater assets over their entire lifespan.

Brian is CEO of Rovco, a rapidly growing innovative subsea robotics business focused on using new technology to reduce costs for subsea operations in the oil, gas, renewables and defence sectors. He founded Rovco, based from a career built from leading change, and the implementation of innovative ideas to solve client subsea problems.

Brian has been working with subsea robotics on large offshore projects for over 10 years. He started his career as an ROV technical specialist in electronics, electrical

systems and networking, leading to managing the delivery of multi-million pound ROV projects across the globe. He has completed thousands of subsea inspection, maintenance and construction orientated tasks, and is now bringing new technology to solve the problems he encountered throughout his career.

14:35 Coffee & Tea Break

14:50 Innovative Flexible Riser Monitoring



Renan Tapias
Senior Engineer
2H Offshore
Engineering

As flexible risers age, the potential for damage to the outer sheath increases as a result of dropped objects, clashing with mooring lines or collisions. This can lead to the flooding of the riser annulus that houses the carbon steel tensile armour wires giving rise to corrosion and an increased integrity risk.

Traditional integrity management strategies for flexible risers include a combination of annulus volume testing and general/close visual inspections. Deploying ROVs and rope access teams to conduct inspections is costly and only identifies damage visible on the outer layer of the pipe. The FlexAssure monitoring solution provides early detection of the loss of structural capacity of a flexible riser, simultaneously lowering the risk of hydrocarbon leakage and reducing the requirement for costly inspections. FlexAssure uses an innovative combination of acoustic detectors, motion sensors and in-built data analysis to identify the failure of the tensile armour wires in the critical top section of the riser. The system listens for the acoustic signature of a wire as it breaks and matches it with the accompanying small rotational changes to ensure the event is an actual breakage. This prevents false readings. The system also monitors the top angle, tension and motion of the riser to provide vital information to correlate analysis models during remnant life or life extension programmes.

The system can be retrofitted to almost any flexible riser and consists of just two field-proven sensor packages, one above the bend stiffener and one below. This ease of installation, combined with innovative uptime-based commercial models, provides a cost-effective improvement to traditional techniques for managing aging flexible risers.

Renan has 7 years' of specialist experience in design, specification, fabrication and offshore installation of flexible pipes. Advanced global and local flexible riser analyst, with experience in strength, installation and fatigue assessments.

Brian joined Pulse in 2012 with 25 years' experience in providing process automation and instrumentation solutions to a variety of industries, on a global basis. This experience includes direct sales, sales team development /management, distribution



Brian Taylor
Head of Sales
2H Offshore
Engineering

channel development/ management and establishing overseas subsidiaries and branch offices, across the world.

Brian leads the EMEA and APAC sales teams, sharing his time between the London, Aberdeen, Bergen and Singapore locations. He is totally focussed on driving the customer satisfaction agenda throughout the business.

15:15 Integrated Flow Metering Solution for Subsea Wells



Mario Alonso
Digital Solutions
Product Leader
Baker Hughes, a GE
Company

Accurate multiphase flow metering is an essential requirement for production optimisation in oil and gas developments, particularly for subsea production applications. This presentation discusses an integrated flow metering solution for subsea wells, describing the technology and summarising benefits in terms of accuracy and optimisation of instrumentation and subsea structures.

The technology comprises a virtual flow metering solution enhanced with discrete subsea measurements within christmas trees and completions. Particularly, the integration of downhole flow measurements, a water sampling device, and typical pressure and temperature measurements associated with each well, increasing the accuracy and insights from the virtual flow meter.

The integrated flow metering solution enables accurate gas, oil, and water measurements for each well, while providing an augmented understanding of production conditions within the subsea production system and reservoirs. The solution is also fully integrated with real time diagnostics and prognostic capabilities for subsea asset integrity and flow assurance, activating additional insights to support subsea production optimisation (e.g. hydrate advisors, chemical injection advisors, etc).

Mario is a Digital Solutions Product Leader at Baker Hughes, a GE Business. He is responsible for the digital solutions portfolio within Subsea Production Systems and Services, and has been focused on development of digital analytics applications for the last 13+ years. Mario has an engineering background and holds a PhD in multi-phase fluid dynamics. He is a chartered engineer and member of the Institution of Mechanical Engineers.