PROGRAMME
Subsea UK Hospitality Suite, Mezzanine Floor, Hall 4, KLCC
11-13TH July 2017

ORGANISED BY
SUBSEA UK
11:00 – 11:30

**Water Dew-Pointing with Subsea Gas Dehydration to Improve Pipeline and Flow Assurance Economics**

During a market condition that is characterized by a prolonged period of relatively low oil price, there is a strong focus on the oil & gas industry on utilising technology that give better economics for the field development, both green-field and brown-field. For deepwater and long distance tieback development, both pipeline and flow assurance related expenses constitute as a major component of both CAPEX and OPEX figures for the development. This presentation aims to share the subsea dehydration technology development status, as well as how it could be applied to improve the overall field economics by mitigating certain pipeline and flow assurance challenges such as top of line corrosion and MEG requirement, by doing water dew-pointing subsea. Highlights on the key features of these novel technologies will be provided, with specific focus on the benefits the technology brings to the market.

*Si is a senior process engineer who has worked for Aker Solutions since 2011. He has over 8 years of professional experience in the oil and gas industry, and specialises in subsea processing technology having worked in Europe and Asia Pacific offices.*

Currently based in Perth, Si focuses on subsea processing and boosting technology applications (including separation, dehydration, cooler, compressor and pump) in the Asia Pacific region. Si graduated with a double BComm and BEng in Chemical Engineering degree from The University of Melbourne in 2009. He currently sits on the committee board for SUT Perth and is a member of SPE.

11:30 – 12:00

**Hybrid Riser Tower – Tailored for Local Shallow Water Needs**

Most people know the Hybrid Riser Tower solution, combining the use of steel pipes in a freestanding bundle and multiple flexible jumpers for connection to a floating host vessel, from the 3 towers installed in 2001 offshore Angola in1,350m water depth to the Girassol FPSO.

Little known is the fact that the first bundled riser tower, in a slightly different arrangement preceding Girassol, was actually installed by Placid in Green Canyon (1988), and the same riser tower was later re-deployed by Ensearch in Garden Banks (1994, now decommissioned), both in the Gulf of Mexico in less than 650m water depth to a semi-submersible production platform.

This paper describes the adaptation of the bundled hybrid riser tower concept for subsea connection to a FPSO in Indonesia in only 90m water depth. The ‘mini’ riser tower, comprising 6 risers in the bundle and installed in 2013, made full use of locally available materials, fabrication labours, skills and facilities, and installation capabilities in the region. This project, and its successful implementation, paves the way for more SE Asian operators to maximise local contents, optimise costs and exercise better project control for their upcoming developments.

This hybrid riser tower solution can lend itself readily for HPHT field developments, or aggressive production fluids, when conventional riser solutions such as bonded or
unbonded flexible pipes, and corrosion resistance alloy (CRA) clad steel catenary risers cannot handle the fluid properties or the shallow depths, respectively. Work is underway to use high quality thermalplastic composite pipe (TCP) as the jumpers in a hybrid tower to overcome the chemical issues.

Frank Lim was a Global Director of 2H Offshore, a company that has pioneered technologies for riser systems that are now deployed in deepwater regions around the world. He now assumes the role of Principal Advisor and is also a visiting professor to China University of Petroleum in Beijing.

Frank’s offshore oil and gas career began in 1983 upon gaining a PhD in the UK, and continued through numerous projects in the North Sea, Gulf of Mexico, West Africa and Brazil, until recently when he turned his interests to deepwater projects in the Asia Pacific, supporting them from the 2H Kuala Lumpur and Beijing offices he set up in the region.

A fellow of the UK Institution of Mechanical Engineers, Frank is a regular author of technical papers and speaker at conferences.

12:00 – 12:30
Deepwater Water Intake Riser – Validation Process

BARDOT Sea Water intake based on HDPE riser is a field proven technology and 6 units have been selected by SAIPEM to equip the TOTAL KAOMBO west Africa FPSOs in 2015. These units were partially built and assembled in Malaysia and Singapore. Kaombo project was the first west Africa commercial WIR based on the HDPE to go deeper than 150m. The technology is also now considered for replacing and improving efficiency of existing steel water risers. Next challenge of HDPE water intake riser is to improve the process efficiency by insuring colder water down to 5°C. The challenge is then to down up to -600m. This new frontier will bring design and structural challenges such as ageing, creep and fatigue. Following the development of its HDPE riser concept, Bardot group is proposing a full qualification method to achieve deep waters and large diameter. The method that will be presented in this paper is coupling numerical models, test on samples and full testing. The aim of this paper will be to present key milestones of the methodology and intermediate results achieved by the Bardot Engineering Team.

Mr Pierre Guerin has spent most of his professional activity working on offshore projects in Europe and Asia. His knowledge covers the areas of offshore floating platforms solutions, naval architecture, marine installation & operations and coastal engineering activities for shallow and deep-waters.

With 7 years spent in Asia in charge of VP engineering and business development, he participated in setting up company subsidiaries in Malaysia and Singapore. The projects he supervised conferred him strong experience and insight in Southeast Asian and Middle Eastern regions.

He is currently managing the LOWPEX Subsea Umbilical Risers and Flowlines offshore business unit of BARDOT Group and is in charge of Technical development of green solutions such as OTEC and SWAC projects of BARDOT Ocean.
**13:30 – 14:00**

**Case Studies Highlighting Rapid Subsea Repair Methods of Pressurised Pipelines**

Effective pipeline design and regular maintenance can assist in prolonging the lifespan of subsea pipelines, however the presence of fishing vessels can significantly increase the risk of pipeline damage from anchor hazards.

This paper will describe state of the art pipeline isolation tooling that enables safe modification of pressurised subsea pipelines. Double block and bleed isolation tools have been utilised to greatly reduce downtime, increase safety and maximise unplanned maintenance, providing cost-effective solutions to the end user. High integrity isolation methods will also be explained that enable piggable and unpiggable pipeline systems to be isolated before any breaking of containment and in compliance with subsea isolation guidelines.

This paper will discuss subsea pipeline damage scenarios and repair options available to ensure a safe isolation of the pipeline and contents in the event of an incident. DNV GL type approved isolation technology enables the installation of a fail-safe, double block and bleed isolation in the event of a midline defect.

The paper will conclude with case studies highlighting challenging subsea pipeline repair scenarios successfully executed, without depressurising the entire pipeline system, and in some cases while production continues.

*Dale has worked in the pipeline and subsea intervention industry since 1992 with involvement in subsea construction, commissioning, repair, isolation, maintenance and decommissioning projects. He graduated from the Robert Gordon University in Aberdeen with a B.Eng (Hons) in Mechanical and Offshore Engineering. He worked as a subsea Engineer as the Client’s Representative on diver and WCROV projects and is an IMCA certified Technical Representative. He joined STATS Group in 2005 and has been involved in the design, development and delivery of bespoke engineered pipeline isolation, repair and recovery solutions.*

---

**14:00 – 14:30**

**Installation of World’s First Subsea High-Pressure Thermoplastic Composite Pipe for Spool and Flowline Application**

This presentation will cover the successful design, qualification and installations of a Thermoplastic Composite Pipe in a subsea spool application on Chevron’s high-pressure Alder field in the North Sea. The Thermoplastic Composite Pipe has been established for some years as a viable alternative to steel and flexible pipe in subsea applications, with various intervention type of applications building track record in the field. Up until September 2016, no TCP had been installed yet subsea for a permanent application: The Alder TCP Spool is the world’s first. The presentation will discuss the TCP specific benefits that lead to a significant total installed cost reduction for subsea spools and flowlines; these benefits include the lack of corrosion, flexibility, the smooth bore in combination with external pressure resistance, and more. It will include an overview of the design, its methodology and results for all loadcases. The presentation will also cover the testing and qualification process it has gone through which has been executed in accordance with the new recommended practise for TCP,
DNV RP F119. This includes the TCP as well as the ancillaries such as end-fittings. What will cover the development of offshore handling and subsea installation procedures, as well as the installation itself, completed in September 2016. The presentation will conclude with an evaluation of what TCP can do to reduce the total installed cost in subsea applications.

Martin van Onna has over 15 years of experience in the Oil & Gas Industry. With a master's degree in aerospace engineering and a professional background in Oil & Gas, well intervention, manufacturing and general management. Martin started the business unit Airborne Oil & Gas in 2007. In his current role as Chief Commercial Officer, Martin is responsible for successful market entry and business development of Thermoplastic Composite Pipe in the SURF (Subsea Umbilicals, Risers & Flowlines) and Subsea Well Intervention markets. Martin leads the Business Development, Marketing & Sales and After-sales Services activities.

14:30 – 15:00

High Performance and Biodegradable Wire Rope Lubricants and Jacking Greases

ROCOL, a UK manufacturer of high performance lubricants for niche offshore applications, explains how using advanced lubricants can maximise uptime whilst protecting the environment and critical assets. Grease Technology has evolved significantly in recent years, increasing the performance gap between high and low-quality lubricants. This presentation highlights some key advancements in technology which address issues such as corrosion, high/low temperature applications, heave compensation, subsea lubrication and environmental regulations. Products from the ROCOL range that integrate these new technologies are discussed, including BIOGEN WIRESHIELD, the world’s first ECO-labelled wire rope lubricant, providing the offshore lifting industry with unparalleled corrosion and mechanical protection whilst minimising harm to marine life. The newly launched BIOGEN TUFLUBE for jacking and open gear applications is providing jacking rig operators performance levels never seen before in biodegradable jacking greases. Discussion focuses upon wire rope, jacking and open gear applications, but also touches upon other applications of interest too.

Brendan has over 10 years’ experience in the high performance lubricants game. Focused on increasing uptime and saving money over the long term, Brendan has been instrumental in developing innovative new products and service solutions in Oil and Gas, Marine, Aerospace, Food and Wind industries. Brendan has helped ROCOL design, develop and launch the BIOGEN range of high performance, biodegradable wire rope lubricants and jacking greases that are proving time and time again to save offshore contractors significant amounts of money.
Cost Reduction through Optimisation of Production Routes for Subsea Components

There are a variety of engineering applications for castings and forgings. Each of these product forms has advantages and disadvantages relating to both the cost of manufacturing and the fitness for intended purpose. Understanding the advantages and limitations is essential to making appropriate engineering choices, which have engineering expectation.

Sheffield Forgemasters manufacturers both forgings and castings for high integrity markets including:

- Offshore oil and gas
- Civil nuclear
- Defence nuclear
- Pressure vessels

We evaluate and recommend appropriate manufacturing routes without prejudice across a variety of markets making judgements informed by our own experience and knowledge gained from the work being carried out by our research and development business RD26.

Pressure is on across the offshore oil and gas supply chain for improved solutions and lower costs. Forgings are widely used in many systems and components but some of these are better suited to castings due to inherent ability to produce nearer net shape, eliminating expensive and lengthy machining. But many engineers won’t even consider castings, believing them to be brittle and lacking strength. This presentation will use examples from other high integrity markets to explode some myths and hopefully, broaden design horizons in subsea engineering. We will also consider the possibility of composite forgings and castings and in a look to the future, the potential of additive manufacturing.

Content Topics:

- What’s a casting, what’s a forging!
- Outline of metallurgy behind mechanical properties
- Examples of castings and forgings in high integrity applications
- Factors governing choice between a casting and a forging
- Alternative methods of manufacture

John Duffy joined Vulcan SFM, the Oil & Gas offshore forgings and castings division of Sheffield Forgemasters in 2011, after a long sales and marketing/business development career in metals manufacturing with Alcan Aluminium, Hydro Aluminium and Outokumpu Stainless. He graduated in foreign languages from Surrey University and also holds a Masters’ degree in Marketing Management from Warwick University, later supplemented by technical and metallurgical studies at the Open University. Main focus in his current role has been on forgings for offshore applications, aiming to leverage Sheffield Forgemasters’ renowned technical and manufacturing expertise in helping our customers find solutions to the new challenges to materials performance in difficult offshore and subsea environments.
11:30 – 12:00

**Improved Operational Efficiency Through 3D Laser Scanning Techniques**

Underwater laser scanning is an emerging technology that is increasingly being used for integrity management. This innovative technology continues to provide accuracy, precision, and cost efficiency improvements for subsea survey, inspection, and engineering operations. The high density true-scale 3D point cloud data generated by underwater laser scanners equips engineers with the accuracy needed to comprehensively assess subsea assets, develop effective design and repair solutions, and make informed decisions in order to ensure continued safe offshore operation. In terms of efficiency, with laser systems the signal between transmitter and receiver is instantaneously received, avoiding signal lag issues commonly experienced with acoustic inspections. This instantaneous signal receipt enables faster vehicle speeds for faster dynamic inspections compared to acoustic technologies. 2G Robotics’ ULS-500 underwater laser scanner has been specifically developed for dynamic scanning with a focus on AUV, ROV, and subsea vehicle integrations; high sample rated; timing synchronization; and continuous data acquisition for faster, more efficient inspections. Through a discussion of specific customer projects and results, this presentation will delve into the use of underwater laser scanning for integrity management and the accuracy and cost efficiency afforded by this innovative technology.

Grace is passionate about underwater robotics, co-founding BumbleBee Autonomous Systems, an award winning autonomous maritime robotics team in the National University of Singapore while pursuing her degree in Mechanical Engineering. The experience exposed her to the operations and challenges faced by users and motivated her to work for Seatronics, the world leader in maritime electronics equipment rental, known for their active investments in cutting edge technologies. In her current position as Sales Engineer with Seatronics, she proposes cost effective solutions to clients in Oil and Gas, Defence and Marine Science.

12:00 – 12:30

**Platform Multi-D for Managing the Full Life Cycle of Projects in Oil and Gas Industry**

ASE has developed Multi-D technology, which enables the creating and managing of information, including 3D data, resources, time and financial data related to any kind of large capital projects for various domains, including, but not limited to, petrochemistry, metallurgy, shipbuilding, etc. Multi-D enables engineers to optimise resources by simulating object construction processes, based on a 3D model, before its actual construction. Engineers can validate the process planning and detailing in a dynamic model of the nuclear power plant, analysing and optimising the plant layout virtually – where changes can more easily be made – prior to the physical build. The technology simultaneously reduces construction time and project costs while increasing labour efficiency, work quality, and safety. The key backbone of the Multi-D platform is Information Management System (IMS), which serves as a single source of information for all EPC activities, including 3D Plant Information Model, with emphasis on BIM and configuration management processes. IMS has been developed to
identify, store, manage and represent facility configuration information and its status tracing. Functional architecture of IMS allows interoperability between different users and roles and services. Capital object information model serve to organise centralised heterogenous data storage, its traceability. IMS consists of several subsystems, which includes document management, PBS, requirements management, equipment management, GBS, project management and 3D visualisation.

Pavel Bruk leads large project to commercialize in-house IT software tools and services for large capital construction projects, into a comprehensive set of PMC offer, making it available on the market worldwide. Pavel has 20+ years of experience working in software and IT industries with focus on CAD and PLM solutions, with a large record of successful projects in aerospace, defense and energy domains. Prior to joining ASE as CIO deputy, he spent many years working as business development director at several large software vendors (Siemens PLM, Autodesk, Dassault Systèmes). He also was leading customer management business in Russia at Honeywell Aerospace.

13:30 – 14:00
Learning and Development from the World’s First Operating Subsea Compression System

After years of development, qualification and engineering, subsea compression technology is now a proven solution to increase the recovery factor for offshore gas developments. The first subsea compression system was installed at the Aasgard field in the Norwegian Sea, which started up successfully on the 17th of September 2015. This represents an important milestone for the oil and gas industry, as apart from representing the successful developments of new subsea processing technologies, subsea compression also proves itself a viable alternative field development option to oil and gas operators. This presentation aims to shares Aker Solutions’ experience on Aasgard subsea compression project, from the design and the project execution phases up to the operational phase, highlighting the key learnings. In addition, the paper will also outline the ongoing development activities to optimize the compression system delivered for Aasgard, with particular focus on the unit size and weight optimization without requiring any qualification activities of new technologies. This new generation of subsea compression system will extend the applicability of this technology to a much wider range of fields and offshore regions.

Salvatore Micali works as a senior manager in Front End APAC where he is focused on early concept, customer engagement and business development activities for the subsea systems. He is involved in the assessment of new subsea production and processing applications, involving also power, process and boosting technologies. Mr Micali holds a BS and MS in Electrical Engineering from the Catania University, Italy.

He has more than 10 years of experience in the oil and gas industry focusing on offshore technologies, in particular production, power, processing, compression and power generation systems. Before starting at Aker Solutions APAC, Salvatore worked for 3 years in Oslo, Norway in the headquarters of Aker Solutions’ Subsea department as well as 4 years at GE Oil and Gas in the Turbo Machinery department in Florence, Italy.
**14:00 – 14:30**

**Cost Effective Subsea Connection Systems**

Subsea connection systems play a critical role in the overall Subsea Production System. As subsea developments have moved into deeper waters, with higher temperatures, and ever growing monitoring requirements - the size, weight, load carrying capacity; complexity and installation times of subsea connection systems have increased. This has a knock-on effect on the size, weight and complexity of the host structures and also increases the overall cost of subsea developments.

In the current industry climate, there is a need to reduce the overall cost of ownership of subsea systems. This paper presents a novel tie-in technology, which is designed and developed to minimize the overall cost of ownership of subsea connection system. Whereas traditional connection system tooling was large, expensive, and required prolonged maintenance and storage, the installation tools of today’s system are minimized. Any tooling needed for installation and contingency are simple, light-weight and can be handled and manipulated by standard work class ROVs ultimately negating the need of a dedicated vessel downline. The heart of this connection solution is the proprietary Dual Metal Gasket technology which provides a superior and reliable sealing solution that is designed to handle the future HPHT (High Pressure / High Temperature) applications. The small footprint of the seal enables optimization of size and weight of the mating hubs and the connection mechanism. This allows the tie-in systems to be compact, light-weight and mobilized faster on smaller vessels by fewer service hands.

*Akshay Kalia is the Product Manager for Subsea Manifolds and Connector Systems at OneSubsea and is responsible for strategic marketing, standardization and new technology development for the Subsea Manifolds and Tie-in systems. Akshay has over 9 years of experience in Subsea Engineering and has held various engineering and management positions around the world. Akshay holds a Master’s of Science degree in Mechanical Engineering from Purdue University and a Master’s in Business Administration from the University of Texas at Austin.*

---

**14:30 - 15:00**

**Fibre Optics – The Future of Pipeline Monitoring**

Over the past few years pipeline integrity, due to a number of spills and highly publicized pipeline projects have become a major talking point throughout the oil and gas sector. Recent advances in signal processing technology have allowed instrumentation manufacturers to design and build more advanced sensing systems which fill the need for pipeline owners to be able to monitor the integrity of their pipelines at a cheaper price per kilometre, more effectively and more rapidly than existing inspection methods.

At the cutting edge of technologies available is Hawk’s Fibre Optic Sensing - Leak Detection System (FOS-LDS). Combining the measurements of vibration, temperature, stress and strain Hawk’s leak detection system is able to detect leak locations within the nearest meter over 50km (and in some cases, up to 100km) stretches of pipeline with a refresh rate of once per second. The measurement principle (Called optical Back Scatter) produces unique frequency shifts that can be disseminated into a range of different diagnostic information which is fed back and processed by the FOS-LDS. The process is extremely responsive and extremely
accurate over long lengths due to the intrinsic physical nature of fibre optic technology.

With Hawks FOS-LDS undetected risks to integrity such as leakage, 3rd Party intrusion, Theft, Rupture, Outwash or Pipe Breakage can be a thing of the past with a low install cost per meter compared to conventional methods.

Mathew Cook began working with Hawk in 2014. He has a bachelor’s degree in Mining engineering from the university of new south Wales in Australia and acts as Hawk’s global application engineer providing a range of instrumentation and engineered solutions throughout a variety of industries all over the world. He also acts as customer liaison and project logistics officer on all Fibre optic sensing project.

Jack Evans began working with Hawk in 2014. He has a bachelor’s degree in Mining engineering from the university of new south Wales in Australia and acts as Hawk’s global application engineer providing a range of instrumentation and engineered solutions throughout a variety of industries all over the world. He also acts as customer liaison and project logistics officer on all Fibre optic sensing project.

Jack Evans is the current Global Director of Hawk Measurement Systems (Australia) and President of Hawk Measurement America. Jack currently lives in Melbourne Australia with his family. Jack has been involved with the process controls industry for over 25 years and recently served as Chairman of the Measurement, Control & Automation Association. Prior to Hawk, Jack was President, CEO of KROHNE, Inc. in Peabody, MA and National Sales Manager for Milltronics in Arlington, TX. Previous to his tenure with Milltronics, he spent seven years with Micro Motion in various positions. He holds a Bachelor’s Degree in Industrial Engineering.
11:00 – 11:30

Platform Dynamic Motion Monitoring – Integrity and Life Extension

There are over 200 platforms offshore Malaysia, across Terengganu, Sabah and Sarawak waters. Most of the platforms were installed over 40 years ago, thus exceeding their design life whilst still operating. Aging platforms must be maintained using routine inspections and new technology to measure the condition of the structures integrity and provide assurance that the platform is safe to operate. Structural deterioration results from a number of reason including corrosion, impacts, scouring, subsidence, fatigue and environmental loads (wave, wind).

Platform dynamic motion monitoring offers a simple, nonintrusive, topside solution that can be installed permanently, continuously monitoring the changes in response and providing alarms when thresholds are exceeded. The same system can also be a standalone and portable for collecting data over a couple of days only, which data can be compared to the initial design’s dynamic analysis. It can be determined from this data if the platforms structural response or natural frequency has changed, in which case, its structural condition may be compromised. If subsidence is occurring the data can show a change in inclination, etc. When compared to wave height, current and wind speed data, it can also be determined which of the environmental loads are predominant in the area. This paper will present platform motion monitoring systems through a number of case studies that were supplied for integrity concerns and life extension purposes.

Steven Gauthier is the Asia-Pacific business development manager for Pulse Structural Monitoring. Steven has been with Pulse for over 6 years and based in Singapore for 4 years. He has a Master in Aeronautical Engineering. He has participated in a number of monitoring projects in the EMEA and APAC regions.

11:30 – 12:00

Alternative SWG Filler Material to Reduce Flange Face Corrosion Related Costs

Bolted flange joints in seawater and hydrocarbon services can be vulnerable to gasket degradation and flange face corrosion. In its document on corrosion management, the UK’s Energy Institute ranks corrosion as the second most frequent cause in initiating loss of hydrocarbon containment in offshore platforms, and highlights corrosion as a major threat to asset integrity and plant efficiency.

Flange face corrosion can be extremely difficult to detect prior to leakage leading to loss of valuable resources. The impact on the environment can also be a major concern as can the immediate safety of plant personnel. Replacement or remedial works often means unscheduled downtime, additional costs and reduced asset efficiency.

Despite its widely-recognised importance to reduce the conditions for crevice and galvanic corrosion, the selection of gasket materials has been historically overlooked in the market until recently. The need for new material combinations has opened up new market opportunities for gasket manufacturers. Although traditional materials such as Graphite, Mica and PTFE have characteristics that can be very useful to flange applications, they do not have the characteristics to offer optimum...
This presentation considers the anti-corrosion characteristics of spiral wound gasket materials traditionally used in seawater and hydrocarbon service and compares them to a new gasket material.

Paul Welsford has worked for Flexitallic Ltd for 10 years, covering disciplines from production engineering, production management, business development in Kazakhstan and applications engineering. Paul is now based in Singapore as the Regional Sales Manager for SE Asia and Australasia. He provides support to the local industries with regards to sealing solutions and shares best practice knowledge on joint integrity. With a BEng degree from Loughborough University in Product Design and Manufacture and being an associate member of the IMechE he has supported new product introduction within Flexitallic leading to overall cost savings and improved safety for plants in a variety of industries.

12:00 – 12:30
Set in a Silver Sea: UK Maritime & Offshore Expertise Working with Malaysia to Improve Safety of the “Ungoverned Space”

At sea a vessel, rig, platform or offshore facility is its own firefighting services without the easy access to land based emergency services. This means safety is paramount. This talk will focus on fire safety and watertight integrity as two key areas defined as the “Ungoverned Space”. The innovative technologies available to resolve these by improved maintenance, inspection and moving towards continuous monitoring as a way to ensure the critical areas are not left unchecked for 364 days of the year. The ability to remote monitor back to the shore-based team will add value. ISO14520 is the international standard for fixed gaseous extinguishing systems. Applicable offshore, this standard gives the baseline minimum practice to be followed, but often shown to be misunderstood. This means that the suppressant gas e.g. CO2 may have leaked and thus not perform at the design concentration required to extinguish a fire. This hazard can lead to catastrophic consequences. Some estimate that on average 20% of the CO2 cylinders of which there can be up to 600 onboard a vessel may have leaked. Thus, ensuring the gaseous systems are tested, the room integrity into which they are situated are tested, and the watertight integrity are vital for working towards improving safety of life at sea and protecting business resilience and continuity. UK expertise in these areas can work closely with nations such as Malaysia to develop best practice and training to solve the Ungoverned Space. Ultrasonic technology is one method offering inspection and monitoring systems, which offers great opportunity.

Adrian Saw is the Research & Development Manager at Coltraco Ultrasonics based in London and is Masters Postgraduate in Geology from Durham University, Adrian has since worked with Coltraco spear-heading the R&D department with a focus in technical implementations to turn research materials into end products. Adrian’s current focus is in developing three world-leading monitoring systems – in liquid level, pressure, and leak detection based on acoustics and ultrasound. Adrian has been instrumental in managing the various R&D teams working with the company, particularly through fostering relationships between key academic institutions such as University of Warwick, University of Durham and University of Strathclyde. Through his academic background, Adrian has strong interests in the offshore oil and gas and energy industry and is currently leading a collaborative structural health monitoring project with the UK’s National Research Centre for Offshore Renewable Energy and University of
Strathclyde. Adrian embodies Coltraco’s principles in upholding integrity, valuing people and thinking how best to serve customers through applying science and mathematics at the core of what he does to assist the company in producing world-leading products and systems to address the market’s needs in Fire Safety, Marine, Naval and Offshore Industry.