

Pipeline Integrity Challenges and Technological Advancement

OIL, GAS AND MINING TECHNICAL DIVISION

reported by



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Speakers and Participant of the event

After 5 months of planning, the Oil, Gas & Mining Technical Division (OGMTD) held the Pipeline Technical Day on 20 September, 2018, at Armada Hotel in Petaling Jaya, Selangor. There were six speakers who were experts in various areas of pipeline and 43 participants.

For the Oil & Gas (O&G) industry, pipelines are the cheapest and safest way to transport hydrocarbons. Low oil and gas prices have forced the industry to rethink the way it typically carries out engineering and operational activities in both brown and green field developments. On new field developments, a lower cost is critical to ensure project financing. New concepts and innovative solutions are required to reduce costs while maintaining the same operational and safety requirements.

For existing pipeline infrastructures, operators need to take a hard look

at managing their operations so as to reduce costs and drive sustained profitability. While pipeline asset integrity management is crucial to ensure safe operation throughout the design life, regular inspections and maintenance may be postponed or even neglected due to the pressure to cut costs. The Pipeline Technical Day symposium focused on technology advancement and current practices that provided cost-effective ways to manage pipeline integrity.

The first speaker was Encik Mohd Suhaimi Mohd Yusoh, a Pipeline Engineer at Murphy Oil Corporation with over 15 years' experience in O&G, particularly the pipeline segment. He highlighted the company's operations in Malaysia and explained the challenges of pipeline operation and maintenance. He shared his experiences in commissioning a water injection pipeline and presented a

case study on managing the integrity of a deep water gas pipeline by applying direct assessment concept for both internal and external corrosion. He emphasised the importance of pre-assessment study – which included flow assurance and corrosion modelling, qualifications of proprietary technology, execution and statistical analysis – to ensure a successful direct assessment programme. Currently, Encik Suhaimi is working on developing integrity management for Fluid Transfer Line – Gravity Actuated Pipeline (FTL GAP), the world's first floating pipeline system.

The second speaker was Encik Adeeb Aisamuddin, Technical Manager for Specialist Inspection Services at Oceaneering Services Malaysia. He covered Inspection and Non-Destructive Testing techniques to ensure pipeline integrity during



En. Suhaimi speaking to the participants

manufacturing, construction and in-service. He spoke on the basics of the various NDT tools and techniques used as well as current advancement in the technology which can help meet the challenges of the pipeline industry such as making inspection faster, safer and more accurate. Technologies covered included Phased Array Ultrasonic, Guided Wave testing, Pulsed Eddy Current as well as Condition Monitoring tools such as wireless Ultrasonic Testing.

Ms. Michelle Lau is a certified Cathodic Protection Specialist and General Manager at Mach3 Engineering Sdn. Bhd. She has been an active member of NACE International for over 17 years and served as its Director for East Asia & Pacific area for 2014-2017. She emphasised the need to take corrosion aspects into consideration during the initial design stage and shared the latest global report on the cost impact of corrosion. Following this was a presentation for a cross-country pipeline as an example of cost optimisation analysis with the use of today's technology and connectivity.

With over 20 years in offshore O&G industry, Mr. Soren Hauch is an experienced pipeline engineering professional with R&D, service provider and operator backgrounds. He spoke on the use of inline pipeline inspections over the last few decades to help operators manage the integrity of their pipeline infrastructure and to significantly reduce the number of pipeline containment failures. But, in terms of what can be achieved when combining the latest inline inspection technology, integrity assessments methods and integrity management software, the journey has just started. Today, we are better

able than ever to detect and assess material properties, geometric anomalies, metal loss, cracks, old repairs and coating damage, allowing for early detection of integrity threats and to accurately measure the efficiency of preventive actions. The result is increased long-term profitability and opportunities for life extensions of assets which will otherwise be condemned for decommissioning. These requirements need to be complied with, with increasingly stringent regulatory and, at the same time, address public concerns relating to the safety of the environment and neighbouring communities.

Mr. Sha Yong, Lead Engineer at 2H Offshore Engineering Sdn. Bhd., has 11 years of experience in offshore O&G industry, including concept studies, design and integrity management of pipeline, top tension riser, steel catenary riser, free-standing hybrid riser and lazy wave flexible riser. Flexible pipes have been used for over 30 years in both riser and pipeline applications. Mr. Yong spoke on flexible pipe failure or damage modes. A risk-based assessment strategy of the flexible pipeline was discussed to qualify flexible pipeline risk level efficiently. Besides this, inspection and monitoring interval calculation were incorporated for integrity management.

With over 13 years' experience in deepwater and subsea engineering, Ir. Dr Jeyanthi Ramasamy is Technical Solutions Manager at Oceaneering International. Her presentation covered major and minor pipeline repairs in shallow and deepwater operations. For a minor repair, a split-sleeve clamp with sealing and mechanical grips capability may be installed on the pipeline to provide structural integrity. In shallow waters, divers need to tighten a number of bolts in a specified sequence to ensure the compression of elastomeric seals and actuation of the mechanical grips. However, repair work which cannot be achieved using the split-sleeve repair clamp, is classified as major pipeline repair. The connection between the old pipeline and new repair spool can now be achieved using subsea pipeline connectors. For depths beyond that for divers, the connectors will have additional features for remote operated vehicle (ROV) intervention for installation purpose. A subsea pipeline repair is a complex operation which requires an experienced team, meticulous planning and execution.

Participants benefitted from the symposium and came away better informed about new technology in the pipeline business, networked with other players and learnt from the experiences of O&G operators as well as contractors/consultants. The event ended with closing remarks from the OGMTD Vice Chairman and the presentation of tokens and certificates to the speakers. ■