

# Engineering Solutions for Mature Subsea & Pipeline Assets



Report on SUT Melbourne Evening Technical Meeting  
Thursday, 16th July 2015

*By Stefania Narum, Subsea Specialist, SUT Melbourne.*

The first SUT technical event to be held in Melbourne for many years was pitched to an Eastern Australia audience and was very well attended. There were three technical presentations on the challenges of ageing subsea and pipeline assets – specifically, rectification works, life extension and decommissioning. The evening was sponsored by Wood Group Kenny, Oceaneering and AMOG Consulting and Wacek Lipski, WGK's Eastern Australia Manager was session chair.

There were also two poster presentations - Hydraulic lift equipment by Hydac Engineering and Subsea Hydraulic Systems Commissioning by Pressure Dynamics.

**Subsea Facilities Decommissioning –Selected Practical Optimisations and Considerations, by Jacki Ford, Subsea Manager, Victoria, Oceaneering Australia Pty Ltd.**

There are many subsea abandonment challenges and Jacki presented four practical examples of recent work in the region. In general terms, these examples were based on a) subsea equipment that is no longer functioning b) uncertainty of well integrity barriers, c) available tooling used on older generation equipment and d) disposing of contaminated equipment.

The first example involved a coiled tubing intervention on a dual bore subsea tree. The problem of limited access was solved by designing a coiled tubing lift frame with a rotatable collar which allowed the surface tree to align on any rig heading. In the second example, the critical well barriers needed while plugging a well were achieved by injecting cement from the tree running tool utilising an ROV hot stab and a double valve barrier isolation. The third example showed how an older generation Installation and Workover interface was optimised by combining multiple functions on a single umbilical line operated via a new ROV panel on the tree running tool. Jacki outlined the regulations and precautions required when disposing of recovered equipment contaminated with Naturally Occuring Radioactive Materials (NORMS).

The presentation included a very interesting case study of the activities and challenges in deconstruction of the Basker Manta development, in Bass Strait. This included cutting the risers from the Detachable Turret Mooring and towing it back to shore, capping and laydown of the remaining subsea flowlines and umbilicals and disposing of 1260 Te of recovered equipment. Well intervention work included placing a cement plug barrier into the Basker-5 well, conducting a pressure integrity test on the Basker-6 well barriers.

## **Pipeline Life Extension, by Nathan Baranello, Design Engineer, Wood Group Kenny Melbourne.**

Nathan started his presentation by pointing out that Australia's pipeline network (onshore and offshore) dated back to the first oil and gas boom in the 1960s and that after 50 years of operation, the operating pipelines were approaching the end of their design life. He described the considerations and lessons learned in validating the extended design life of 50 onshore and offshore pipelines. Whilst onshore and offshore pipelines use different standards, the life extension approach was the same.

The technical challenges of validating old pipelines against new standards were met by critically reviewing theoretical predictions vs reality, challenging code compliance issues and assessing risks and coming up with alternatives. Some successful alternatives included 1/ A characteristic wall thickness (rather than the minimum WT of the worst defect) was used to validate the theoretical pipeline calculations for current conditions; 2/ Corrosion growth rates, which typically consider depth only, also considered length and defect interaction to establish fitness-for-purpose; and 3/ high risk areas such as riser splash zones required additional inspection measures to get reliable data (UT in addition to ILI).

## **Protection of Melbourne Main Sewer Trunkline Yarra Crossing for Channel Deepening Project, by Dr Andrew Potts, AMOG Consulting.**

When the Port of Melbourne wanted to deepen a channel, Melbourne's essential main sewer pipeline previously buried would be vulnerable to shipping interference and a long term protection strategy was needed.

Dr Potts started his presentation by outlining the typical interference risks and protection options, including the impacts of dropped or dragged anchors and rock berm designs, interlocking concrete mattresses and steel plates.

He gave an informative presentation on rock berm design generally and the rock berm design chosen for this application and showed video of anchor drag tests that were performed to prove the design.

Following the presentations the attendees crossed over the road to The Long Room to enjoy some drinks and nibbles courtesy of the nights sponsors.