

# FLNG is coming...

## What does this mean to the subsea industry?

Report on SUT Perth Branch Evening Technical Meeting  
Wednesday, 15<sup>th</sup> October 2014

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This was the last and arguably the most popular technical evening of the year, given to 250 SUT members and guests crammed in at the largest room the Parmelia Hilton had to offer. It was a result of months of careful planning and preparation by Alastair Walker, Guillaume Allegret and Ian Finnie (who chaired the evening). They had carefully selected what proved to be a great blend of specialists who were able to give their visions for the FLNG future, from the perspective of their technical backgrounds. These specialists presented from a vast range of experience, either with solid FLNG familiarity our veteran practitioners having the wisdom from seeing the emergence and development of other technologies.

Ian set the scene with a quick reflection on whether FLNG can be the positive hoped-for game-changer to the industry, qualified with anticipation of the inevitable challenges that it would encounter, and that the presenters would go on to describe.

Alan Gillen, who was already known to many in his role as Woodside's Pipeline Technical Authority commenced with the perception that our local offshore pipeline industry could be "doomed". He then cleverly structured his presentation to completely dispel this perception by describing the actual technology requirements, stressing that our local industry could meet those challenges. Central to this was the fact that whilst it is clear that although the FLNG facilities do not require large diameter long export pipelines, which the local industry has become accustomed to designing and constructing, they do require a multitude of small to medium diameter shorter infield gathering lines. Tapped into HTHP (high-temperature and high-pressure) reservoirs these "lively" gathering lines are complex to design, manufacture and install, which presents an attractive opportunity for our local industry to meet these emergent technology requirements. This conclusion set the evening off to a welcome and positive start.

Although considerably the youngest presenter, Ben Holland from Fugro Advanced Geomechanics, offered considerable first hand experience from real-life design of anchors of large floating gas in Western Australia's "Cyclone Alley." Ben described how colossal these facilities are and used movies to effectively illustrate how they must be able to withstand the very worst combinations of winds, waves and currents that occur on our planet, resulting in highly complex cyclic loads in excess of 2,500 tonnes per anchor. This is compounded by the fact that most of the seabeds have the consistency of toothpaste at mudline, and are more water than solid. Ben succinctly explained how all of the principal anchoring challenges can be overcome using clever engineering approaches, giving confidence that anchors for FLNG were something that could be reliably designed.

The third speaker was Jon Gould who, with 30 years of experience in the industry as a naval architect took us on a deep dive into one key technological aspect relating to offloading LNG from an offshore FLNG facility. Firstly he explained how side-by-side offloading had only limited precedents in the industry so far. He then identified the key hydrodynamic differentiators in taking LNG offtake technology to an offshore environment and explained why limitations in analytical methods and model testing would mean that the risks will only be fully mitigated in the full scale environment when tested offshore. The evening would not have been the success it was without the multitude of questions from the floor and active participation of the audience, and this was particularly the case here. Arguably the most provocative question was given by Terry Griffiths who asked Jon to predict what the one thing that the industry could look back to with the benefit of hindsight and say "why didn't we think of that". It appears that the actual performance of large FLNGs in complex metocean conditions could be such an area of latent uncertainty.

The final presentation of the evening was given by the captivating speaker and adjunct professor at UWA, Kevin Mullen, who gave an overview of the truly revolutionary FLNG approach that largely avoids expensive and vulnerably long export pipelines plus politically, socially and environmentally sensitive land-based facilities, by placing the LNG plant offshore and accommodation, right above the subsea wells. Kevin posed the question "What about the subsea equipment? Does it need to change? Can it be optimised for FLNG?" He explained how FLNG can use the existing suite of underwater technologies for developing remote gas fields then focused on "smarter" subsea infrastructure which could help to give technical, economic and operational edge needed to establish FLNG as a new means to open up Western Australia's untapped gas. He ended his presentation on a positive note by saying that certain operators in the industry have a fantastic track record of developing cutting edge technology, like FLNG can be, into established and game-changing technology.

Kevin ended the technical side of the evening along with outgoing SUT Chairman Ray Farrier in acknowledging Chris Lawlor who was a founding contributor to the SUT in Perth but who very sadly recently passed away. In a small way perhaps, the quality and participation of this exceptional technical evening was felt to be a tribute to Chris.

Like many of our Evening Technical Meetings, the night was enhanced with a few drinks and nibbles thanks to our generous sponsors: Fugro AG, INTECSEA and Peritus International to whom we are all very grateful.