

## Report on SUT Perth branch evening meeting 20<sup>th</sup> June 2007

### Umbilicals

The Melbourne Hotel was the venue for the mid 'winter' meeting of the Perth SUT branch where the key subject of Umbilicals was presented. Umbilicals are the life-line of any subsea system and the importance of their performance and reliability grows as projects become wholly dependent on subsea production. This is exemplified to extreme in the subsea to beach and very long distances, remote area, tie-backs that feed LNG plants that are the backbone of hydrocarbon supplies to growing northern economies and the long term prosperity of Western Australia.

DUCO kindly sponsored the event which attracted an audience of over 100 people, many of whom are working on projects wholly dependent on reliable performance of Umbilicals.

Umbilicals, the means of communicating life to the subsea system from the earliest days continue to grow and evolve. Over the years challenges have been overcome from resisting aggressive fluids, demanding stress and dynamic conditions to provide reliable very long distance means of operating subsea systems. Competing systems and methods have fallen by the wayside leaving systems tied to and dead without Umbilicals. The recent advances, new challenges and applications were addressed by three of the worlds leading entities this evening.

**Carl Roemmele**, Business Development Manager SEA of Oceaneering International, presented: **Combined Electro Hydraulic Pump Umbilicals – System Design Challenges** Focusing on combined power and control umbilicals, Carl provided examples that are operating significant pressure boosting systems. Carl discussed OI's approach to thermal FEA in large power systems and the influence on electrical and reliability performance.

**Kjell Garvik** VP Sales & Marketing Asia Pacific of Aker Kvaerner, presented how his company are, **Meeting the global offshore industry demand by improving the steel tube umbilical designs through analysis, testing and developments.** Kjell outlined AK's proven method of building steel tube umbilicals and highlighted the various design aspects to reduce fatigue in dynamic applications. Kjell's presentation also included AK's development of carbon fibre strength members for very deepwater application where weight to strength ratio becomes critical in both dynamic applications and installation conditions.

**Ian Probyn** PES Engineer, and **Joe Wong** Senior Development Engineer of DUCO presented two separate subjects aimed at improving design, performance and reliability of umbilicals.

Ian presented the **Application FEA for Umbilical Installation Assessment.** Ian described how finite element analysis techniques have been developed and validated against full scale tests to enhance the understanding of the structural behaviour of steel tube umbilical systems. Ian described the application of FEA to predict the umbilical performance during A typical installation procedure involving a caterpillar type tensioners and an over-boarding chute. The results from the FEA gave a unique and detailed insight into the structural performance which provides confidence in an umbilical cross section design before manufacture.

Joe presented DUCO's work in addressing **Reduced Permeation Cable Design for Umbilical Service.** Joe explained how low insulation resistance issues have become an increasing problem for the subsea production history. Work undertaken by Woodside to date indicates that this is caused by the deterioration of subsea connectors due to hydrogen and water finding its way into the connectors as a result of migration through and along the electrical cable. Joe presented the work undertaken on the development and testing of a cable with greatly reduced permeation to water & hydrogen. The resulting cable design and tests to date promise a significant step forward in resolving the problem of hydrogen migration through cables in warm water environments

The presentations were all well received, running to time and allowing sufficient questioning sessions. The continuing improvement in understanding the behaviour and performance of umbilicals leads to high reliability and more accurate life predictions. As more production becomes dependent on umbilicals the increasing level of understanding, presented during the evening, reduces risk and allows better planning and more confidence decisions.

The Society acknowledged, with gifts of wine, the efforts of the speakers for their presentations, particularly when three of the speakers had travelled from the UK and Malaysia. Over refreshments and canapés, provided by DUCO, the normal social discourse and industry background chatter ensued.

The details of future meetings and seminars focusing on metocean, reliability and remote data gathering will be communicated as normal and posted on the SUT website [www.sut.org.au](http://www.sut.org.au) Also look at courses being offered for subsea systems, flexible pipe and marine operations both in Perth, Melbourne and KL and other regional locations shortly and watch out for a growing number of ever popular courses.