

PRESS RELEASE

**SUBSEA 7 PRESENTS PAPERS ON ITS AWARD WINNING
MECHANICALLY LINED PIPE TECHNOLOGY AND ON THE
DEVELOPMENT OF GIS TO SUPPORT FIELD DEVELOPMENT PROJECTS
AT OTC 2012**

Subsea 7, a global leader in seabed-to-surface engineering, construction and services to the offshore energy industry, will deliver two papers on the final day of this year's Offshore Technology Conference (OTC) in Houston, USA, on 3 May: on Mechanically Lined Pipe installed using reel-lay and on the evolution of Geographical Information System (GIS) applications to support offshore field development projects.

Subsea 7's Senior Welding and Materials Engineer Grégory Toguyeni, based at Subsea 7's Aberdeen office, will present the paper 'Mechanically Lined Pipe: Installation by reel-lay', which he received a commendation for in the prestigious Best Mechanical Engineering Paper Award at this year's OTC.

Mechanically bonded bimetal pipe in towed pipeline bundle projects has successfully been used for many years by Subsea 7 and has demonstrated it to be a viable cost-effective alternative to more expensive options such as solid corrosion resistant alloys or metallurgically clad pipe. The work presented in the paper was undertaken to demonstrate to the industry the feasibility and significant advantages of installing mechanically lined pipe (Bubi[®] pipe) by the reel-lay pipeline installation method.

The Pipeline Industries Guild recently presented Subsea 7 with its Subsea Pipeline Technology Award for 2012 for the application of the technology.

The second paper, titled 'GIS support for field development projects: A contractor experience and perspective', is by Subsea 7's Michel Marrannes and Keith Collins. The paper shows the use of GIS applications for several large offshore construction

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projects in West Africa and the North Sea over the last six years. They also demonstrate how GIS “now has the capability to encompass all the phases for Life-of-Field, from tender to as-built, and then during operation support and maintenance, ultimately until decommissioning and abandonment.”

ENDS

2 May 2012

**Paper Ref OTC 23096
Mechanically Lined Pipe: Installation by reel-lay****Abstract**

A cost effective solution for the transportation of corrosive fluids was considered as the combination of mechanically lined pipe (Lined Pipe) installed by the reel-lay technique. Mechanically bonded bimetal pipe has been successfully used in towed pipeline bundle projects by Subsea 7 over many years and has been demonstrated to be a viable cost-effective alternative to more expensive options such as solid corrosion resistant alloys (CRA) or metallurgically clad pipe.

The work presented in the paper was undertaken to demonstrate to the industry the feasibility and the significant advantages of being able to install mechanically lined pipe by the reel-lay method.

Test strings were manufactured and subjected to a conservative full scale reeling simulation program. Accurate metrology of the carbon steel carrier pipe and CRA liner surfaces was performed at different stages of manufacture and simulated installation, including prior to and after full scale plastic deformation. High frequency resonance fatigue testing was carried-out to assess the post-reeled endurance of the joint SCR application. Material and corrosion testing were done and Finite Element Analysis was performed in order to predict the capacity of the installation procedure to prevent wrinkle formation.

A total of nine test strings were used as part of the development program and it has been demonstrated that, for high quality lined pipe, the proposed methodology and procedures, which utilise internal pressure, permit the pipe to be installed on the seabed fully fit-for-purpose with no formation of any wrinkles. Also, it has been possible to demonstrate that the liner behavior as predicted by the FEA showed good correlation with the observations made during the full scale reeling simulation. Finally, the tested pipes met the target fatigue life requirements.

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The work was performed in compliance with DNV recommended practice for new technology qualification RP-A203 (DNV-RP-A203, 2001) and awarded “fit-for-service” status.

Paper Ref OTC 23308**GIS support for field development projects: A contractor experience and perspective**

Abstract

GIS (Geographical Information System) technology is now regularly used for data management and data exchange of geosciences seabed survey information. The operational implementations of GIS in support of SURF (Subsea infrastructures, Umbilicals, Risers and Flowlines) field development projects are however relatively new. This paper presents, from a contractor’s experience and perspective, GIS applications used for several large construction projects performed offshore West Africa and North Sea over the last 6 years for a variety of operators.

The GIS functionalities have expanded progressively from project to project. The implementation of web-based GIS server has been an important step forward, allowing much easier data access to non specialist project stakeholders and offshore teams. The GIS is used during the overall project cycle, from tender to as-built. Each stage of the project has its own requirements and priorities.

At design stage, the main applications are for seabed assessment and pipeline routing. Some bespoke applications have been developed, such as a “planning visualisation tool”, to anticipate potential SIMOPS (Simultaneous Operations). At offshore installation stage, the field status is changing rapidly, often on a daily basis. The main objective is then to capture the relevant information as soon as possible, and as close as possible from the effective data source. Once validated, the data are published onto the project WebGis, which becomes the primary project reference, used as a “live” deliverable.

At as-built stage, the main objective is to integrate all pertinent data, from the successive project phases, engineering, fabrication, installation, metrologies, as-laid/as-built surveys, in order to produce the final as-built documentation. Within this process, a quality control and best fit analysis are performed, as the different data sources have different positioning accuracies. The final GIS geo-database is organised with several main features datasets. The data model for the subsea infrastructures was initially aligned on the published ESRI APDM (ArcGis Pipeline Data Model), but a simpler data structure has also been derived and implemented, for easier use by both the GIS engineers and final users. This can be adjusted according to the Operators own specifications for the Life-of-Field GIS, and also to any future industry standard.

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Notes to editors:

1. Subsea 7 will have a major presence at this year's event. As well as presenting conference papers, it will be exhibiting at stand 1641. On display will be examples of the Company's deepwater and ultra-deepwater technical expertise and its investment in its fleet.
2. Subsea 7 S.A. is a seabed-to-surface engineering, construction and services contractor to the offshore energy industry worldwide. We provide integrated services, and we plan, design and deliver complex projects in harsh and challenging environments.
3. For further information visit www.subsea7.com