

Recent Developments in Design & Installation of High Temperature CRA Clad Pipelines

Wednesday, 10th June 2015

Parmelia Hilton Hotel (Swan Room), Mill Street, Perth

Registration 5.30 pm: Presentations 6.00 pm – 7.30 pm Networking over drinks and finger food 7.30 pm – 9.00 pm

Chaired by: **Ian Finnie, Integrated Geosciences Technical Authority, Fugro AG**

A common feature for a number of recent pipeline projects has been that they have been designed to transport high temperature fluids and the risks of corrosion have been such that the pipes have been lined with corrosion resistant alloy (CRA) materials. These factors have required developments in the method of design and also in the installation procedures, particularly in welding as part of the pipeline manufacturing. The experience gained in these projects has been that if the industry is to reduce costs of design of high temperature pipeline and particularly in the welding of CRA lined pipe we must learn from our recent experience. The talks in this Technical Evening consider the future requirements for geotechnical testing and interpretation to provide pipeline engineers with appropriate pipe-soil properties for the design of lateral buckling and axial walking during design. Welding and inspection of pipelines with CRA materials has been shown to be difficult and very expensive. Two presentations address possible changes in the welding process to reduce the number of rejected welds and developments in the current practices of carrying out engineering criticality assessment (ECA) during pipeline design to provide accurate definition of acceptable weld flaw sizes.

Developing a more accurate description of soil-pipe interaction for the design of high temperature pipelines

David White, Shell EMI Professor of Offshore Engineering, The University of Western Australia

A governing parameter in the analysis of lateral buckling of high temperature pipelines is the equivalent lateral friction. Experience has shown that the determination of this parameter for a pipeline on a practical seabed can be quite complex and may result in a wide range of possible values. The presentation describes recent work carried out to reduce that possible range of values, such that the effort involved in pipeline design calculations is much reduced.

The changing role of ECA in pipeline design

Alastair Walker, Director, Advanced Mechanics and Engineering Pty Ltd.

The talk presents the current practice with regard to completion of an ECA. Particularly, the requirements for material, pipe and weld properties that are involved in the ECA calculations are considered. The presenter describes the changes that are occurring in the design and operation of high temperature and CRA lined pipes that are driving changes in the methodology for ECA analysis. The presentation concludes with a consideration of the changing interactions between ECA and pipeline design that are likely to impose an enhanced role for ECA in future projects.

Technical (and other) challenges associated with welding and inspection of CRA pipelines

Matt Lancien, Materials & Welding Engineer, SPEC Pty Ltd.

Recent pipeline installation projects in WA have highlighted the technical complexities of welding and inspecting during offshore construction of CRA HP/HT flowlines. This presentation outlines the various challenges related to CRA welding and inspection from the early design, linepipe procurement, qualification testing and final offshore installation. A successful pipeline production is influenced by specifying realistic and achievable requirements and also needs critical control of all the activities by experienced and trained personnel. Additionally, the importance of learning from recent project experiences and how operators and contractors can work together to 'get it right the first time'. The presentation concludes with an insight of the latest technology developments in the industry that will enable enhanced reliability and consistency in the welding and inspection for future CRA pipeline projects in Australia.

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