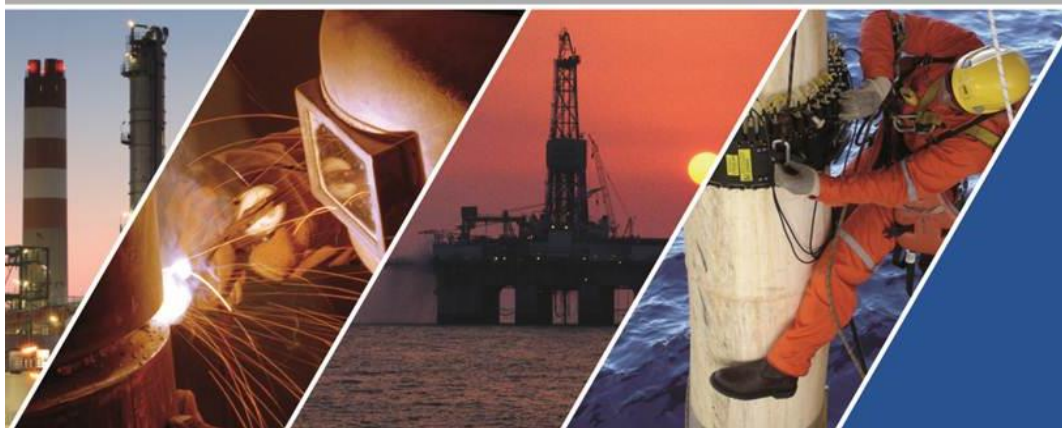


Characterisation of Materials and Components from Decommissioned Offshore Structures



**PUBLISHABLE
SUMMARY**

24298

Background

Five Shell operated Indefatigable (Inde) Platforms previously located 75km offshore in the Southern North Sea and installed between 1970 and 1986 have recently been decommissioned.

The availability of several decommissioned North Sea structures for detailed study under controlled conditions provides a unique opportunity to advance the industry's understanding of the behaviour of structures following extended environmental exposure.

Following the retrieval of the Inde structures which was completed in June 2011, Shell UK and TWI have launched a Joint Industry Project (JIP) to allow other organisations to participate in broadening the knowledge base concerning such structures. A detailed inspection of selected nodes and piles to establish their current condition and remaining fatigue lives is currently in progress funded by Shell. Findings of these work packages will be made available in full to participating sponsors. In addition the JIP will fund further work packages on the recovered materials.



Image of Inde Juliet, courtesy of Shell UK.

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Objectives

The objective of the proposed study is to improve the management of the risk of life extension beyond a structure's original design life by gathering benchmark data that can support the decision making process and increase the understanding of the effects of extended environmental exposure.

Project Outcome

- Access to an extensive database of materials properties for steels adopted in the North Sea in the 1970s and 1980s.
- Improvement of the knowledge base on ageing processes and degradation mechanisms for future life extension studies.
- Progress reports describing all experimental procedures and test results will be issued every six months, prior to each Sponsor Group meeting. At the close of the project, a final report detailing the work performed and the main results and conclusions will be issued.

Benefits

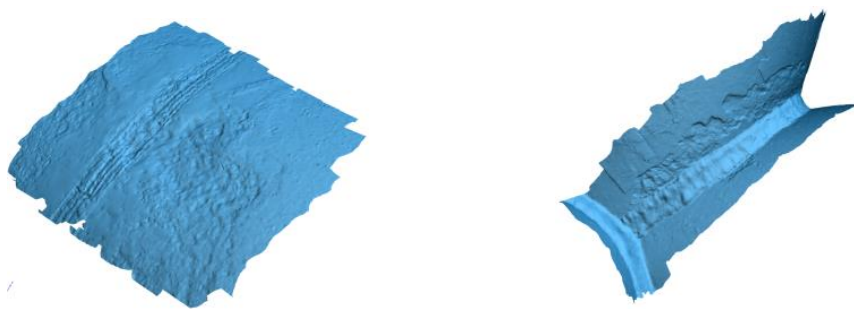
- Improved understanding of the degradation of North Sea structures which informs structural integrity management and implications of service life extension.

Scope of Work

The programme of work involves gaining sufficient data on the condition of the recovered material by means of non-destructive and destructive inspection, as well as a comprehensive suite of material characterisation tests and full scale/strip fatigue testing of nodal joints to provide an assessment of the structures.

A review of previous inspection reports including known material properties at the time of fabrication and a fracture mechanics assessment using the derived properties is also proposed.

The project has been split into a number of discrete Phases. Phases 1 – 3 are funded by Shell as a Single Client Project (SCP) and comprise the literature review, NDT and material characterisation. Phases 4 to 6 are funded solely through the JIP and comprise further material characterisation, residual stress measurement, and fatigue endurance testing. The results of the work performed from the SCP are made available to all members of the sponsor group.



Images showing 3D corrosion mapping of a pile section circumferential weld and a brace to brace intersection on a nodal joint.

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Participants

The Sponsor Group Comprises:

- Shell
- Allseas
- HSE
- PSA
- ADMA OPCO

Price and Duration

The project has duration of 3.5 years and a budget of £550,000 for project work at TWI, in addition to in-kind contributions from Shell (see above) and HSE. The Project currently has 3 fee-paying Sponsors each making a contribution of £110,000.

Further Information

For further information on how a Joint Industry Project (JIP) runs please visit:

<http://www.twi.co.uk/services/research-and-consultancy/joint-industry-projects/>

JIP Co-ordinator: Tracey Stocks

Ref: 24298/2/17 v2

Email: jip@twi.co.uk

Project Leader: Matthew Dore

Email: matthew.dore@twi.co.uk