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Flowline Towout Option for Deepwater Subsea Tie-Back—Perspectives From a Verification Point of View

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Abstract

A number of installation contractors and oil companies are looking at innovative methods for development of deep water oil and gas fields. One of the options looked at is the use of towed pipelines for subsea tie-back. Traditionally towed lines have been used for shallow and conventional water depth. Using this kind of pipeline for deep waters requires a new approach to design and installation, which again requires that verification would be handled in a different way. The paper will be based on the technical requirements given in DNV-OS-F101 "Submarine Pipeline Systems", ref 1., and follow a risk based approach as given in DNV-OSS-301 "Certification and Verification of Pipelines".

Introduction

Moving into deeper waters will require a new approach and use of new technical solutions. The risk of applying this new technology can be high, but it can also increase the value of the investment if the uncertainties are managed. Risk Based Verification and Certification is not the answer to all the challenges, but is one of the means to manage the risks associated with deepwater development. This paper will outline the benefits, describe the process of verification and marine warranty and outline how this applies to deep water bundles.

Verification Trends

Verification has historically been carried out with a variety of scope and depth of involvement. The depth of involvement, or level of verification, has not always been very transparent.

Some national authorities require verification or certification of offshore or onshore installations (assets) and have appointed specific organisations qualified for this work. Some of these national authorities may have detailed requirements to the verification or certification activity, while

others leave the definition of the necessary work up to the appointed organisation. Other national authorities require specific documents to be verified and approved by them, some hold the owner responsible for the verification activities, others again may not have any specific requirements.

The trend is that authorities remove themselves from the prescriptive regimes and convert to functional requirements and safety and risk approaches. It is therefore believed that there will be a stronger demand for measurable objectives to be presented by the owners. The objectives are linked, as a minimum, to the expectations from the authorities on safety to the work force, the public and the environment. Economics may be an additional minimum requirement from the owner and his partners.

As a means to fulfilling these expectations business today is often characterised by a defined desire to systematically balance expected costs and benefits. The aim is an optimum control of the uncertainties (or risks) related to the objectives.

Even where national authorities do not require verification of installations, verification is a convenient tool for the owner to get an independent evaluation of the contractor(s) work or to show financiers, partners, insurers and the public that the asset complies with relevant safety levels and other requirements in the asset specification.

It is good business practice to subject important work to a third-party check as this reduces the possibility of errors remaining undetected. Third-party verification will ensure that the verifier has an independent view and perspective when performing this activity. Furthermore, it will avoid the situation where errors could be overlooked by engineers or others because of their closeness to the work with the asset.

Systematic risk based assessment methods are more often used to identify the risk associated with the elements. Based on this identified risk, focus is put on the relevant acceptance criteria pertaining to integrity, functionality, survivability, availability, reliability, maintainability, and environmental impact of an asset throughout its lifecycle.

The result of the systematic identification of risk can be utilised in the design and construction by the Contractor and by the Owner or a 3rd party to optimise the verification activities through a well defined and transparent verification plan.

Not all projects nor all high risk or critical elements have great degrees of novelty or innovation requiring a large degree of sophistication when predicting risk. The high risk elements or phases can often be determined by what is addressed in