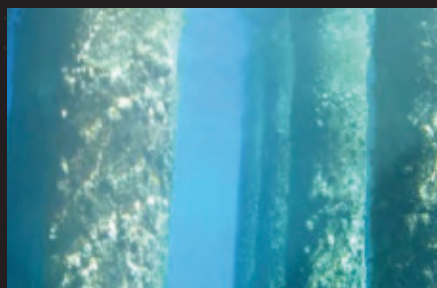


CONDUCTOR INTEGRITY MANAGEMENT STUDY

OVERVIEW

This case study covers how an offshore operator approached the integrity management of platform well conductors that had suffered long-term external surface deterioration both above and below the waterline. The visible condition of the conductors, combined with uncertainty surrounding potential underlying damage, was considered a risk to the asset's remaining life extension period.

The operator identified a need for corrective actions to improve conductor integrity management over the platform's remaining lifecycle.



THE CHALLENGE

The asset was beyond original design life and with a five year extension planned as minimum there was a requirement to establish a robust integrity management plan and corrective actions to safeguard the conductors over the remaining lifecycle.

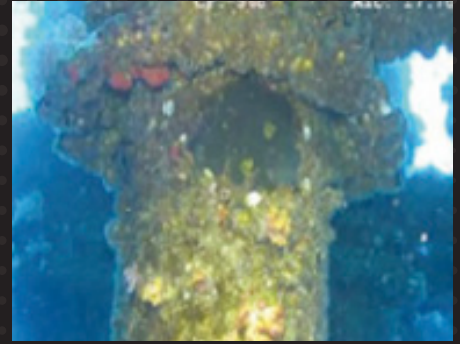
Existing integrity management standards didn't define the requirements for managing conductor integrity, exposing a gap in the integrity framework that needed to be addressed. The request was for Opus Integrity to look at what are the common degradations and failures of platform well conductors and identify what could be applicable to the asset. Identify the risks relating to conductor failures and make an assessment of the platform conductors condition based on the available data and information.

In addition, conduct an independent review of the current asset integrity management standards and guidance in relation to conductor integrity management. Identify the gaps and make recommendations for improvements and update as required.

THE SOLUTION

The approach was to provide a short term scope and also identify long term solutions to the operator.

- Perform a conductor failure study to identify common conductor failures known across the industry.
- Identify the types of conductor failures applicable to the asset. Make a high level assessment on the overall condition of the conductors based on available data.
- Review the wells history to identify any with known internal integrity issues.
- Cross reference findings to identify wells at higher risk based on internal integrity issues.
- Identify the effect on well integrity and the consequence of any failure occurring.
- Review the current WIMS structure in relation to conductor integrity management and identify gaps to be addressed.
- Develop sufficient integrity management processes and guidance for the short-term conductor integrity management as input to the WIMS.



Conductor failure study
and WIMS gap review.



Assess condition of
conductors. Review well
integrity history and cross
reference to identify higher
risk wells.



Update WIMS to cover
short term conductor
assurance and management
requirements.

CONDUCTOR FAILURE STUDY

The conductor failure study looked at what the common conductor issues and failures are across the industry and identified any that could be relevant to asset wells.

It also provided supporting information to the WIMS update and added some justification for implementing any short and long-term assurance and management requirements.

The conductor failure study covered:

- Conductor and structural support overview – design types, installation methods and centralisers.
- Conductor failures – common types of failures, causes of defects or failure and potential consequences.
- Conductor integrity management – IM plan, methods of inspection, monitoring, analysis and remediation.
- Inspection and remediation – available technology to perform cleaning, inspection and remediation of conductors.
- Well integrity – identify potential well integrity conditions that increases the risk if conductor failure occurs.
- Asset conductor condition - identify conductors with higher risk concerns based on available data.
- Combined conductor / well integrity review to assess the relevant wells with integrity issues and conductor concerns.

WIMS UPDATE

WIMS review and update was done in 2 parts.

1. Review of the WIMS structure and content in relation to conductor integrity management. Identify gaps and areas that required update.
2. Provide adequate guidance and instruction on conductor integrity management for the short-term requirements with flexibility for a more defined update in the future that will be driven by future conductor inspection and risk analysis.

Updates and additions to the WIMS related to conductor integrity management:

- Platform Structural Integrity
- Criticality of Well Barriers
- Annulus Pressure Management
- Conductor Integrity Management
- Integrity Management Planning and RA
- Conductor Assurance / RBI / Monitoring
- Engineering Analysis
- Life Extension / ERP