

LIFE EXTENSION STUDY OF OFFSHORE WELLS

OVERVIEW

This case study looks at the development and evolution of a life extension assessment process that was designed to evaluate the integrity condition, risk and suitability of offshore wells that were beyond design life and identified for life extension operations.

THE CHALLENGE

An independent Oil & Gas operator took ownership of mature offshore assets and were faced with the immediate challenge of managing late life extension of the asset.

One key area of that challenge was life extension of ageing wells that were nearing or already beyond design life with the objective of ensuring that they could be safely managed and operated over an assessed life extension period.

The scope was to develop and qualify a suitable process specific to performing integrity based assessments of the ageing wells with the purpose of safe life extension operations.

The process had to be:

- **Versatile** – assess any operational type of offshore well.
- **Generic** – same phased process applied to each review.
- **Aligned** – with integrity standards (WIMS), local regulatory requirements and relevant industry guidelines.
- **Measurable** – against risk and operational criteria for LE suitability.
- **Manageable** – revisit / update any time during the LE period.

The output from the assessments had to support the operators Management of Change (MOC) process for operating wells beyond design life and to also support the notification process to the regulator on the planned change in well status.

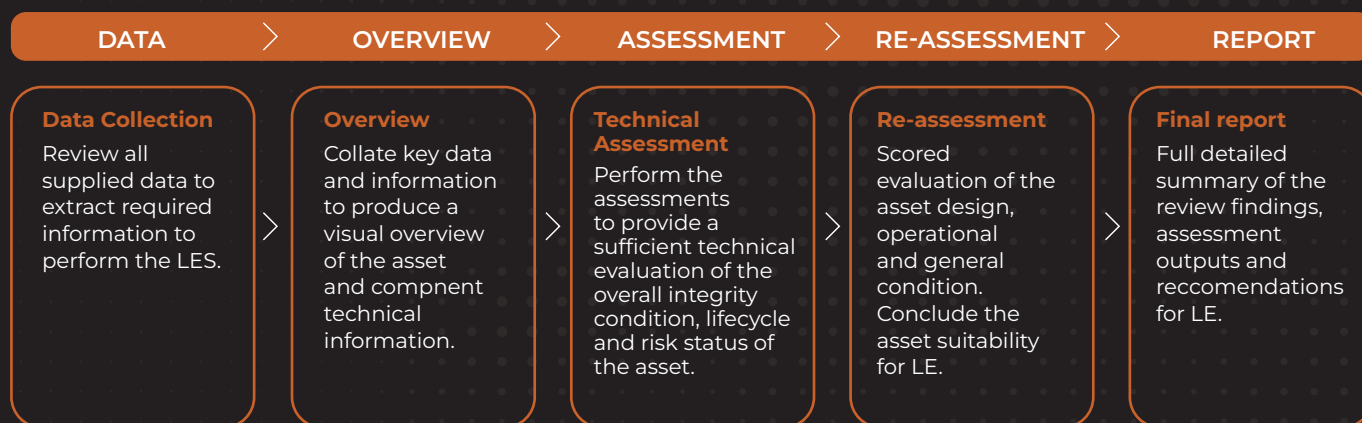
THE SOLUTION

The process was developed taking primary guidance from industry standards specific to Life Extension:

- **NORSOK Y-002** – Life Extension for Transportation Systems (covering wells).
- **NORSOK U-009** – Life Extension of Subsea Systems document (covering Xmas Trees).
- **SINTEF REPORT A15322** – Ageing and life extension for offshore facilities in general and specific systems.

This was used to develop the application that could provide a thorough technical assessment and review of the complete well envelope and conclude if it was suitable to be operated and managed safely over a target or recommended LE period.

Each well assessment was performed to the same phased process.



LIFE EXTENSION STUDY (LES)

Each phase of the LES included:

- **Data Collection** – data review and extract well information.
- **Overview** – visual overview of well construction, technical data and information.
- **Technical Assessments** – evaluation of the well integrity condition and status:
 - Safe operating limits
 - Well barrier
 - Degradation
 - General integrity
- **Re-assessment** – scored evaluation of the risk and operational suitability for LE.
- **Final Report** – all findings, outputs and recommendations.

LES OUTPUT

The life extension assessment process was initially qualified on a few different types of well to ensure that it was fit for purpose and could be utilised to assess any well.

Including the qualification of the assessment process a total of 14 wells were assessed on suitability for life extension operations.

The wells were aged between 20 to 40 years old and were a mix of operational types and status (oil producers, water injectors and gas injectors) .

Wells were both operational and long term shut-in and with varying known integrity issues. The well construction were all different designs and fitted with a wide range of OEM equipment.

TOTAL WELLS ASSESSED	LIFE EXTENSION STUDY RECOMMENDATION
10	Suitable for LE Operations
4	Not Suitable for LE Operations