

# Extending the life of maturing assets

OIL AND GAS  
SERVICES

Technological advances and high oil prices are driving a requirement to extend the life of oil and gas installations.

By assessing the asset's current condition, the safety and environmental implications of continuing to operate, and the cost and practicality of any upgrade work, we can help operators make informed decisions on the feasibility of extending the life of their asset. We also help the operator demonstrate continued integrity of the asset over its extended design life.

## The benefits of our services

Our services help provide confidence that:

- the safety of the asset is retained
- the predicted level of investment required for the period of extended life is accurate
- integrity strategies are revised to ensure maintenance and inspection intervals, activities and costs are optimised, and
- legislation, industry standards and client guidelines are adhered to

These services help the duty holder ensure fitness for purpose and enhance revenue over the extended lifetime.

As industry experience with the factors that influence asset life extension grows, we can confidently refine our strategies. This allows us to make recommendations to clients that will further mitigate risk while continuing to optimise performance to the very end of the asset's life..

## A holistic approach

Our approach offers a range of services that contribute to extending asset life. These can be delivered as individual packages or collectively, taking a holistic approach to all applicable asset elements.

The services apply to all business drivers for extending asset life, including where:

- extraction of remaining reserves has become commercially viable
- technological advances can allow access to previously inaccessible reserves
- subsea satellites are being used to increase production, and/or
- additional pipelines or other facilities are re-routed to make use of the asset being assessed.



Our approach can be applied to all asset areas (e.g. structures, electrical, safety) and is based on the following steps:

- establishing current condition
- comparing current condition with historical data and process environment to establish trends
- re-assessing to help predict the period of extended life
- verifying minor and major modification projects.



## Integrity re-assessment

Your asset may need to be re-assessed to take account of deterioration, through fatigue and corrosion, to establish its level of integrity and help determine repair work that should be considered. For example, in the structural area, this is achieved by using state of the art analysis techniques, including:

- hydrodynamics
- finite element models that calculate stresses at fatigue sensitive locations
- fracture mechanics
- collapse analysis, and
- mooring and riser dynamics.

These techniques provide an accurate damage assessment that:

- identifies the effectiveness and costs of mitigation measures – avoiding unnecessary repairs
- identifies critical areas prone to deterioration
- provides accurate deterioration rates, and
- allows targeted and optimised inspection and maintenance routines.

On satisfactory completion of the analysis, a statement is issued for the assessed number of years of extended life.

A similar approach applies to all other discipline areas and plant types.

## Optimising asset life

By analysing baseline and historical data against the current condition of the installation, trends can be identified. By combining our knowledge and experience of installations operating in similar environmental and process conditions, we can identify factors that could compromise the safety

and performance of the installation during its extended life.

In order to maximise production, integrity and monitoring strategies will need to be revised to reflect changes in operating conditions such as increased sand production, water cut, operating pressures or temperature.

While personal safety and environmental performance are of paramount importance, additional performance benefits can be realised, including:

- avoiding or deferring shutdowns
- more efficient operation
- optimised planning
- effective logistics – the movement of people, spares and equipment have sufficient lead times
- clear and auditable records.

Our services range from managing the collation of inspection data to providing a fully integrated integrity service that includes:

- process plant (to API 579)
- pipelines and structures
- lifting equipment
- safeguarding systems
- electrical and instrumentation.

We consider the life-cycle stage of the installation holistically – its original design, its repair and maintenance history, the environmental and process conditions in which it is operating and plans for its future operation. This approach allows us to provide optimised levels and types of intervention i.e. inspection techniques, locations and frequency, monitoring and mitigation measures, and maintenance, repair and replacement schedules.

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