


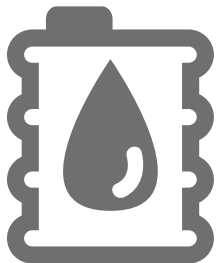
FOUR LIFE

Extension Strategies For Ageing Assets



“Ageing is not about how old your equipment is; it’s about what you know about its condition, and how that’s changing over time.”

HSE information Sheet No. 4/2009



More than 70 per cent of the fields in the oil and gas industry today are classified as mature. The majority of the installations that stand above them are categorised in the same bracket.

Natural decline rates in existing fields is averaging approximately 7 per cent across the board, reducing annual supply capacity by as much as 5.5 million barrels per day. With the era of easy oil almost gone and forgotten, it has never been more important to squeeze as much as possible out of the resources that we have. And that will mean prolonging the lifespan of the producing assets that make the industry tick.

There are a plethora of factors that influence the life extension problem, including:

- *Field economics*
- *Oil price*
- *Decommissioning costs*
- *Corporate policy*
- *Changing production levels*
- *Changing fluid composition*
- *Degradation of equipment*
- *Maintenance*
- *Obsolescence*
- *Regulatory changes*
- *Knowledge management and retention*

In this piece, we will take a look at four procedural approaches that will help you to decide on the best way to go about planning for the life extension of your facilities.



Safety Critical Elements (SCE)

Safety critical elements (SCEs) are categorised by the UK Health and Safety Executive as: Such parts of an installation and such parts of its plant (including computer programmes), or any part thereof -

- (a) the failure of which could cause or contribute substantially to; or
- (b) a purpose of which is to prevent, or limit the effect of, a major accident.

Proper management of identified SCEs ensures that safety barriers - physical or non-physical elements which prevent, control or mitigate undesired major accident hazards (MAH) - are in place and functional. When SCEs are identified, they are prescribed a defined performance standard (PS), which governs the required level of performance for the SCE to managing hazard in terms of:

- Functionality
- Availability
- Reliability
- Survivability
- Interaction/ Dependency

Review of these SCEs is vital for the longevity of your safety system and to make sure that it is fit for purpose.

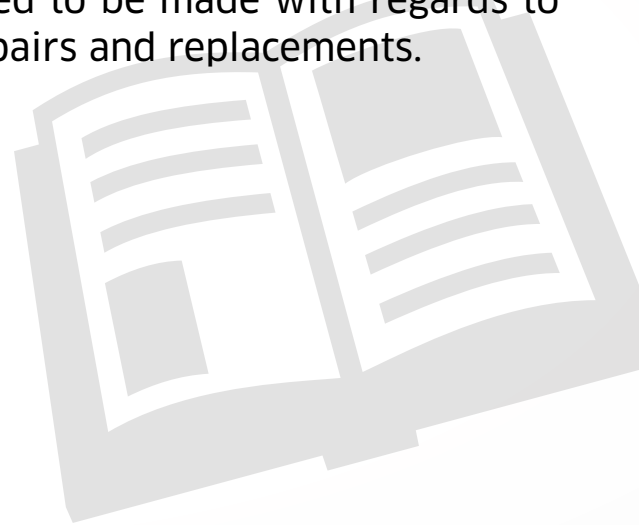


Reliability Availability and Maintainability (RAM) Study

A reliability, availability and maintainability (RAM) study, takes into consideration all factors affecting production in order to forecast performance over the lifetime of the asset.

The RAM study will draw on a number of sources, such as failure data, corrective maintenance logs and root cause reports, in order to model and assess the effectiveness of a host of factors like equipment replacements, retirement, redundancy and demand requirements.

This will inform the strategic decisions that need to be made with regards to improving late-life revenues and prioritising repairs and replacements.





Remnant Life Assessment (RLA)

The remnant life of equipment is determined by predicting both external and internal degradation. This remnant life assessment (RLA) is modelled on a raft of datasets drawn from subsea and structural installation conditions data, the integrity database and data derived from risk-based inspection (RBI) methodologies outlined in standards like API RP 581.

As well as collating reliable data from these sources, it is crucial to interface with key personnel. Interviewing the people that work on the asset in question day in and day out will help to bring into focus a holistic view of the asset that cannot be gleaned from cold data alone.

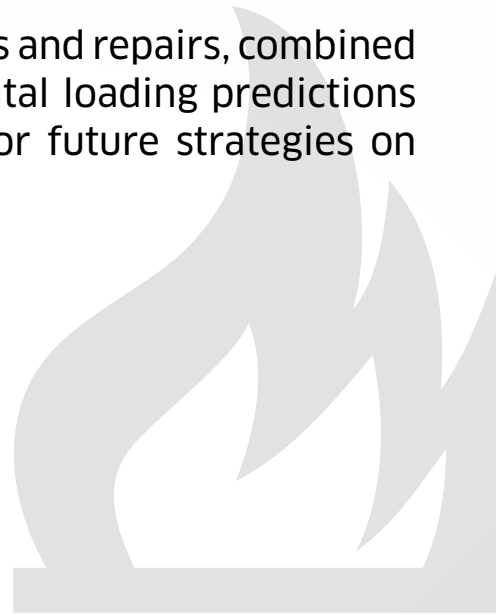
An accurate forecast of the remnant life of your asset will prevent unplanned downtime from component failure, saving money in the long-term and mitigate risk.



Structural Design Life

During the lifespan of an installation its design life and duty will change due to many factors, some of which may be economic – as in fluctuating oil prices and tax regimes – and others physical, such as additional discoveries tying back to the existing platform and enhanced oil recovery techniques.

A thorough and exhaustive log of structural modifications and repairs, combined with comprehensive design data, changing environmental loading predictions and weight control reports will form the foundation for future strategies on design life extension.



Get the latest updates on:

→ Safety Critical Elements (SCE)



Akhmad Khaqim

Senior Process Safety Specialist,
TALISMAN ENERGY

→ Reliability Availability and Maintainability (RAM) Study



Jamal Abu Nahla

Head - Reliability,
GASCO

→ Remnant Life Assessment (RLA)



Fiorenzo Calo

Loss Prevention Specialist,
STUDIO ING CALO

→ Structural Design Life



Nigel Wayne Nichols

Custodian - Structural Integrity, Maintenance
and Engineering, PETRONAS CARIGALI