Life Extension Assessments for Subsea Pipelines

**What** is a life extension assessment?  

**Why** perform a life extension assessment?  

**How** is an assessment carried out?  

**When** should the assessment process start?
What is a Life Extension Assessment?
An engineering assessment to determine the **feasibility** of extending the **service life** of a pipeline system beyond its **specified design life**
Why is a Life Extension Assessment needed?
Why perform a Life Extension Assessment

- Fabrication
- Installation
- Commissioning
- Operation

Design

- Metocean
- Buckling/Walking
- Fatigue
- Stability
- Corrosion/Erosion
- Materials
Why perform a Life Extension Assessment

PAST

PRESENT

FUTURE
How is an Assessment carried out?
How is an assessment carried out?

Revision: 2010
Risers and pipeline transportation systems (metallic pipe, bonded and unbonded flexible pipe)

Revision: 2011
Rigid metallic pipes

Revision: 2016
Rigid and flexible pipelines and flowlines and associated manifolds, skids, risers, tie-in spools, jumpers, subsea control systems that connect them.
How is an assessment carried out?

Define the Boundary of the Assessment

Pipeline system constitutes the:
- Pipeline
- Components
- Systems
- Interfaces
How is an assessment carried out?

Assessment Work Flow

1. Collect Pipeline Integrity Management System (PIMS) data
2. Evaluate integrity of Pipeline System
3. Define future life needs
4. Identify threats and degradation mechanisms
5. Collect additional data (if required)
6. Evaluate against life extension requirements
7. Investigate remedial measures for life extension
8. Document life extension assessment
How is an assessment carried out?

The assessment focusses on determining **remaining life** of the pipeline, given **known condition** and **future operating conditions**.

The threats that are assessed may include:

- internal corrosion – erosion – external corrosion –
  - fatigue – buckling / walking – stability –
  - physical damage (denting / impact) –
- condition of valves – condition of control systems –
  - condition of pig launchers and receivers –

Will the metocean / geotechnical conditions remain the same?
How is an assessment carried out?

Assessment Outcomes

The pipeline can continue operating….

for X number of years under […] service conditions

as long as…

[…] remedial action is taken

[…] inspection and monitoring activities are carried out

to manage XYZ future threats

Photo credit: Saltel
When to perform a Life Extension Assessment?
When to perform a Life Extension Assessment

- End of design life is approaching + continued service need is identified
- How early the process should start depends on:
  1. Level of confidence in existing data
  2. Clarity on future service conditions
  3. Regulatory review and approvals timeframe
Key Advice for Success
Key Advice for Success

- Start the process early
- Integrity management system
- Historic inspection, monitoring, maintenance and repair data
- Clear definition of future operating conditions
- Dedicated resources (and the right ones)
Questions?
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