

# Life Extension & Beyond Subsea & Pipelines

Perth

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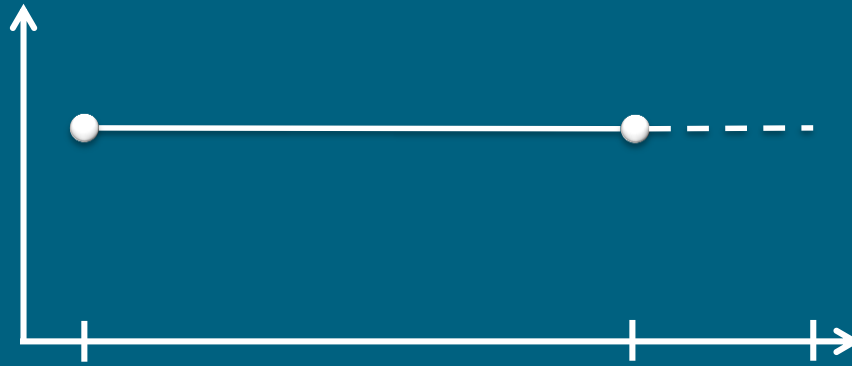
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- + safe
- + reliable
- + efficient

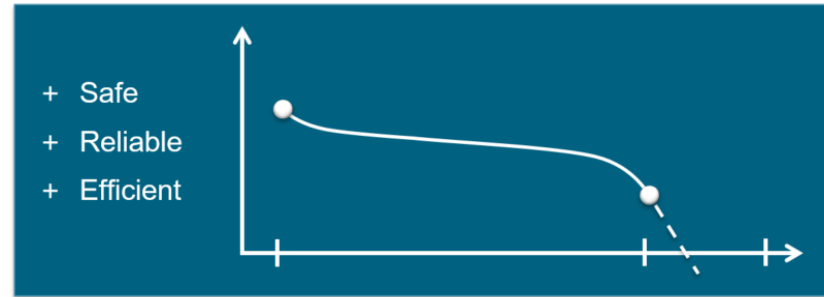


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### What causes a change to conditions?

- + corrosion
- + fatigue
- + erosion
- + operating out of design
- + design changes
- + obsolescence
- + change to use case



### Why is Subsea different?

- + “Evergreen” strategy
- + long term plan - short term view
- + limited action in Operate Phase for Subsea
  - inspect
  - monitor
  - maintain
  - repair

### 1TL (first trunkline)

- + 30 year design (1984 – 2014)
- + applied the NORSOK principles (Norwegian petroleum standards) and independent validation
- + conservative design was a benefit
- + metocean requirements have increased since build
- + innovation – O tube showed seabed interaction
- + started life extension early (studies 2006 – 2012)
- + regulator engagement
- + life extended to 2041

## Lessons Learnt

- + start life extension early
- + engage stakeholders early
- + need a whole of asset lifecycle approach
- + data is hard to find for older assets
- + make decisions early
- + manage all changes
- + operate equipment with discipline for the long term
- + focus on the wear out failure mechanism
- + long term condition change difficult to see
- + design conditions change over time

- + plan – not if but when
- + manage the change – always
- + innovate – think differently

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