PLATFORM DECOMMISSIONING IN THE NORTH SEA

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Introduction

- Assets -> have a life cycle

- Parameters
  - Aging asset and fields
  - Expansion pipeline systems
  - Changing requirements / engineering standards
  - Technology development
  - Legislation

- Maintain – Repair – Replace

- Remove – Decommission

(Source: GASSCO)
Platform Decommissioning Cases

- B11 – platform bypass (2013)
- Huldra - platform decommissioning (2014)
Decommissioning – Background analysis

- By 2019 (UK Cont. Shelf)
  - 140 fields could cease production by 2019
  - Spending up 50% on decomm. work

- Many applications for Decom (www.gov.uk)

(Source: www.uk.gov)
Decommissioning – Background analysis

Key UK projects (examples):

- Murchison Field       - CNR
- Brent A, B, C         - Shell
- Miller                - BP
- Stamford & Rose       - Centrica

(Source: [www.uk.gov](http://www.uk.gov) - Miller decommissioning)
Decommissioning – Background analysis

(source: Oil & Gas UK)
Decommissioning – Background analysis

Annual Estimated North Sea Decommissioning Expenditure

Source: Oil & Gas UK[^1], Mackay Consultants[^2]
Platform Decommissioning Cases

- B11 – platform bypass (2013)
- Huldra - platform decommissioning (2014)
Case 1: Frigg – Bypass

Objectives:
- MCP-01 platform to be removed and decommissioned
- TP1 platform to be bypassed - connect the Alwyn line to the UK line

Alternatives;
- Depressurizing and flooding
- Local isolations

Frigg field overview (Source: University of Aberdeen, Frigg history article)
Case 1: Frigg – Bypass

- 3 off isolation tools used
  - 2x 32in SmartPlug® tools
  - 1x 24in SmartPlug® tool

Field overview during bypass operation (Source: TDW)
Case 1: Frigg – Bypass

**TP1 bypass operation**

- 1x 24in SmartPlug® isolation  
  - July 31\textsuperscript{st} – Aug 14\textsuperscript{th}
- 1x 32in SmartPlug® isolation  
  - Aug 5\textsuperscript{th} – Aug 8\textsuperscript{th}

Field overview during bypass operation (Source: TDW)
Case 1: Frigg – Bypass

- MCP-01 bypass operation
  - 1x 32in SmartPlug® isolation
  - 2x pigs
- Aug 4\textsuperscript{th} – Aug 23\textsuperscript{rd}
- Returned St. Fergus Aug 26\textsuperscript{th}

Field overview during bypass operation (Source: TDW)
Case 2: B11 – Bypass

- Removal of B11 from Norpipe
  - Similar to H7 bypass in 2007

- Subsea bypass spool

- Two risers cut and spool tied in

- Alternatives;
  - Depressurize and flood pipeline
  - Isolate platform from pressurized line

(Source: PTIL)

(Source: GASSCO)
Case 2: B11 – Bypass

- Use of two SmartPlug® isolation tools
- 60 bar pressure
- 11 days of isolation
- 300km pigging to shore
Case 2: B11 – Bypass

Sequence of events 2013

- 04.june: Loading tools
- 08.June: Tools set
- 08.-18. June: Tie-in operation
- 18.June: Unsetting tools
- 18.-21.june: Pigging to shore
- 22.June: Tools retrieved
Case 3: Decommissioning - Huldra

- Huldra – decommission old platform
  - Tie-in of new platform - Valemon

- New platform tie-in alternatives:
  - New line (177km) to Heimdal
  - New line (27km) to existing line (Huldra/Heimdal)

- Solution chosen:
  - Tie-in to existing line between Huldra and Heimdal

Source: Andre Osmundsen / Statoil
Case 3: Decommissioning - Huldra

Alternatives
- Decommission pipeline to make inert and safe
- Isolate local section using inline isolation tooling.

Solution
- SmartPlug® tool isolated local section to prevent flooding during the tie-in operation and maintain production

Source: Andre Osmundsen / Statoil
Case 3: Decommissioning - Huldra

- Production gains
  - Continued production from Huldra for an additional five months
  - No decommissioning, flaring & flooding
  - Isolation for 89 days @ 74 bar (avg.)

- Additional gains
  - Remote monitoring of isolation from shore
  - TDW tracking system including cabled, acoustic, radio link and GSM-based monitoring

Source: Andre Osmundsen / Statoil
Other cases

- 2005: 2x20in GOM region - Platform de-commissioning
- 2005: 16in GOM region - Pipeline de-commissioning
- 2006: 20in GOM region - Platform de-commissioning
- 2007: 36in North Sea region - Platform de-commissioning
TDW – SmartPlug® technology

- SmartPlug® isolation (Frigg bypass animation)
Summary

SmartPlug® inline isolation technology provides significant advantages to:

– Minimize de-commissioning & re-commissioning scope
– Minimize disruption to production
– Avoid shut down or enable only partial shut down of system
– Cost & schedule