Decommissioning in the North Sea: 
*Market Overview, Challenges & Opportunities*

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www.decomnorthsea.com
Today’s discussion

- What Structures?
- Why Decommission?
- What is involved?
- Scale, Cost & Cost Drivers?
- Technology & Innovation
- Decom North Sea Leadership

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Steel Piled Jacket (SPJ) structures
CNR International – Murchison Platform

- Programme progressing (COP January 2014)
- Topsides - 24,548 tonnes – 26 modules
- Steel jacket - 24,640 tonnes (excl piles)
- Water depth 156m – 150 miles NE of Shetland
- 33 platform & subsea wells
- Drill cuttings pile – degrade naturally in time
- Export pipeline – remedial rock placement
Gravity Base Structures (GBS)

Shell Brent Field

- Brent Delta ceased production December 2011, Brent Alpha and Bravo November 2014
- Three GBS likely to remain in place subject to OSPAR derogation
- P&A of wells underway
- Topsides preparation underway
- >300 studies –
- First project for Pioneering Spirit in UKCS
Steel Piled Jackets / Platforms
Southern North Sea

- @400 installations
- Typically less than 1,500 tonnes jacket weight
- < @1,400 tonnes topsides weight
- Many unmanned (i.e. no accommodation)
- Mainly gas producers
- Total removal expected
Subsea infrastructure

- wells P&A
- manifolds
- flowlines
- umbilicals
- mid height arches
- protection covers
- mooring systems
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Why Decommission?

General situation in UK Continental Shelf

- £14.8 billion CAPEX in 2014 - forecast of max £11.3 billion in 2015
- Capital investment to fall by £2-4 billion per year from 2015.
- £39 billion of capital investment approved and under development
  
  **However:**
  
  - Production in UKCS fallen for 11 straight years (41% 2012-2014)
    
    *Although, OGUK Activity Survey 2015 states 2014 production represents the best year on year performance in 15 yrs. (>3%) – due to >focus on production efficiency, impact of new start ups.*
  
- Concerns over unplanned shutdowns, reliability of equipment etc.
- Some operating assets are more than 30 years old
- Oil price uncertainty

Resulting in several assets nearing CoP and decommissioning
CNRI Murchison:
Falling Production Profile

Monthly Oil Production M3

Start Project

1980
1995
1999
2002
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Wintershall Project Example

Project: K10-B
Location: North Sea, NL
Execution: 2014
Wintershall Project Example

Phase I
Phase I - B
Phase II

1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors (11)
5. WH lower deck
6. WH leg extensions
7. WH jacket
8. Living quarters
9. PP main deck
10. PP leg extensions
11. PP jacket
1. Vent boom 
2. Bridge 
3. WH upper deck 

Calculated: 835 t 
Weighted : 620 t
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors (11)
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors (9)
5. WH lower deck

Calculated: 140 t
Weighted: 160 t
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors (9)
5. WH lower deck
6. WH leg extensions
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors (9)
5. WH lower deck
6. WH leg extensions
7. WH jacket
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors (9)
5. WH lower deck
6. WH leg extensions
7. WH jacket
1. Vent boom  
2. Bridge  
3. WH upper deck  
4. Conductors (9)  
5. WH lower deck  
6. WH leg extensions  
7. WH jacket  
8. Living quarters  

Calculated: 500 t  
Weighted: 520 t
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors
5. WH lower deck
6. WH leg extensions
7. WH jacket
8. Living quarters

Calculated: 1220 t
Weighted: 1000 t
Removal Phase 2
1. Vent boom
2. Bridge
3. WH upper deck
4. Conductors
5. WH lower deck
6. WH leg extensions
7. WH jacket
8. Living quarters
9. PP main deck

Calculated: 1810 t
Weighted: 1850 t
Disposal Yard
Big Things: Big Engineering
Game Changing Solutions
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Decommissioning facts
- 10% installations decom’ed so far
- >600 installations still to be decom’ed
- @25,000km pipelines
- >10,000 wells in North Sea
- >550 wells in SNS UKCS

Decommissioning Financials
- @£46Bn forecast to 2040
- £1Bn spend in 2014 (4% of UKCS)
- £2Bn spend expected by 2018
- Some overruns of up to 40%

Need for:
- Significant efficiencies
- Improved ways of working
- Focused approach
STATE OF PLAY:

What has been decommissioned so far?

**North Sea:**
- 120 O&G Installations
- 255 wells P&A over the last 5 years
- 966 pipelines

**UKCS:**
- 2 with large steel jacket (> 10,000 tonnes)
- 3 installations with large concrete substructures
- 25 other steel jackets
- 24 floating installations
- 22 subsea installations
- 11 other facilities (loading buoys, flares etc.)

@10% of installations decommissioned to date
Summary of Forecast Activity

Circa 40 programmes in progress
Circa 60 further programmes under discussion
Forecast Expenditure (2014 to 2023)

Increased Uncertainty in Forecasts

Source: Oil & Gas UK
Activity in the Norwegian sector

**Conoco Phillips:**
- Removal of 10 platforms in the Ekofisk field complete
- Last topside removed 2014, onshore disposal into 2015
- Next removal campaign: pre-planning started
- P&A of 23 wells starting in Q4 2014
- 3-4 Topsides to remove, preparing for tender process
- 4-5 Substructures to remove, preparing for tender process
- Onshore Disposal preparing tender process

**ExxonMobil**
- Jotun B under consideration for removal

**Talisman:**
- Decommissioning of YME Gamma MOPUStor forecast 2015-2016
Activity in the Norwegian sector

**Statoil**
- Gullfaks SPM loading buoys dismantling and disposal ongoing
- TOGI manifold disposed at Stord
- H7 platform from German sector removed and disposed (for Gassco)
- B11 platform from German sector removal underway (for Gassco)
- Ekofisk 2/4S jacket offloaded at Stord for dismantling and disposal (for Gassco)
- Huldra – under consideration for removal

**BP**
- Ekofisk 2/4G (Valhall RP) equipment removal and topsides being prepared for removal.
  Bridge removed in 2014.
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www.decomnorthsea.com
The decommissioning industry's only independent members organisation focussed on all aspects of the decommissioning value chain.

Membership is from across the whole sector:
- 24 operators (incl. Shell, Marathon, Centrica, BP, CNRI, Talisman....)
- Contractors - marine, subsea, onshore disposal, wells P&A, legal, environmental, specialist services, technical services, consultants

As a not for profit organisation we are working to:
- enhance knowledge transfer
- facilitate collaborative activities to deliver “game changing solutions” that minimise decommissioning costs, ensure best value for tax payers and maximise business potential for its member companies.
DECOM NORTH SEA

What we offer

A strong platform:

- @315 global members
- Engaged, knowledgeable & passionate
- Growing UK wide profile
- Making a difference
- Dedicated Board and team

On which to build opportunities:

- Reduce the cost of decommissioning
- Maximise economic recovery
- Create a strategic plan for the future
- Create a centre of excellence for decommissioning
- For our Members
DECOM NORTH SEA

Project Ideas

Listening to Members

Workshops

Open Space Consultations

Prioritised Projects

Facilitated Sessions

Member Surveys

Face to Face Meetings
DECOM NORTH SEA

Projects

- Streamlined template for decom programme
  DECC approval
- Late Life Planning Portal (L2P2)
- Lessons Learned
- Market Intelligence
- Circular Economy - Reuse overview,
  Mattresses and Removal options
- Earlier selection and engagement of
  contractors to stimulate innovation and
  alignment
- Mapping of decom initiatives
- Decom Safety Case

- Streamlined roadmap for EIAs
- Collaborative multi-party approach to
  wells P&A (with DECC/OGA)
- New innovation and technology for
  well P&A (with ITF, OGA, OGUK)
- Conferences/exhibitions, consultation
  events, networking events
- Decommissioning Training Courses
- Southern North Sea special interest
  group with EEEGR
LATE LIFE PLANNING PORTAL (L2P2)

L2P2 is a portal for information designed to help all participants and stakeholders in the decommissioning arena. It is a medium through which parties can share ideas, methods, processes, lessons learned, tools and products that will help people and companies plan and execute decommission projects and programmes.

L2P2 brings value to:

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<tr>
<th>Owners</th>
<th>Supply Chain</th>
<th>Regulators</th>
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</thead>
<tbody>
<tr>
<td>• Guidance from others who have executed decommissioning programmes</td>
<td>• Showcase tools, processes and guidance to owners • Identify gaps in owner processes (creating business opportunities)</td>
<td>• Insights to how Owners and Supply Chain members are approaching decommissioning challenges • Identify best practices</td>
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Any person or company with access to the L2P2 portal can offer content. All content will go through a robust quality review process before being published.

Launch L2P2 (V1)
DNS/OGUK St Andrews conference 19th November, 2015
MARKET INTELLIGENCE

**Business opportunities**
Specific contracts awarded and future opportunities

**Current projects**
Specific information about current decommissioning projects.

**Well P&A**
An overview about well plugging and abandonment (P&A) and useful data about future projects.

**Ports and decom yards**
Information about Ports and Yards involved with decommissioning around the North Sea

**Market projections**
Information about the future of the industry. Forecast oil and gas decommissioning projects are displayed on an interactive map.

**Case studies**
20+ decommissioning case studies sourced from DNS members and non-members.

**Completed projects**
a list and related information about completed decommissioning projects.

**Offshore wind energy**
An overview about the offshore wind energy decommissioning’s future.

**http://decomnorthsea.com/market-intelligence**
DNS PROJECTS

• Enable members to learn from the experience of decommissioning projects already undertaken
• Provide links to individuals/companies with experience and expertise gained in specific aspects of these projects
• Stimulate learning by facilitating reviews of completed projects
• Architecture of approach must ensure it is efficient to use, content is peer-reviewed and database is maintained

LESSONS LEARNED

Key benefits

• Cost reduction
• Safety improvement
• Enhanced environmental outcomes
• Innovative member companies can promote their capabilities
• Best practice content for professional development /training
WELL PLUG AND ABANDONMENT (P&A)

**Multiparty Well P&A:**
Collaborative approach – OGA led with DECC, DNS and 8 SNS operators
Develop collaborative P&A campaigns; new technologies;
Reduced costs/efficient Well P&A.

**New Well P&A Technology:**
Collaborative approach – ITF led with OGA, OGUK, DNS
P&A is forecast to be circa 50% of decom costs.
New technologies have the potential to significantly reduce costs.
Market review of current and future technologies.
# Summary:

## Scope, Timing, Cost, Challenges

<table>
<thead>
<tr>
<th>The decommissioning market is here and it’s growing.</th>
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<tr>
<td>In 2014 @£1M was spent on decommissioning.</td>
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<tr>
<td>£14.6 billion Forecast from 2015 to 2023 compared with £14.4 billion capital expenditure in 2013.</td>
</tr>
<tr>
<td>Volume/demand increasing against finite resources</td>
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<td>The costs are escalating, this cant (wont) go on.</td>
</tr>
<tr>
<td>Uncertainty is growing, global oil prices</td>
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<td>Regulatory action will increase</td>
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Thank you