BP North Sea
growing our business to
2020+

OGUK Share Fair 2016
• Introduction
• BP’s North Sea Strategy
• Procurement and Supply Chain Management (PSCM) Process
• Context and Challenges
  – Corrosion Under Insulation
  – Subsea Systems
• Questions
Forward-Looking Statements

During the course of this presentation we may make forward-looking statements regarding future events or the future performance of the company. No reliance should be placed on forward looking statements which are included only to provide indicative information and should always be considered in conjunction with an assessment of the political, economic, social and legal environment in which BP operates.

Such forward looking statements speak only as of the time of this presentation today. Accordingly BP does not undertake any obligation to update or revise them, whether as a result of new information, future events or otherwise, other than that as required by applicable laws.
• Lower for longer but demand steadily increasing to 2035
• Greater focus on competitive incumbent positions
• Significant potential remaining in UKCS
• Norway – repositioned: focus the business in the UKCS
• UK strategy evolving
Share Fair 2015 – now executing and strategy evolving…

Safety
- Safety remains No. 1
- No accidents,
- No harm to people,
- No damage to the environment
- Control of our hydrocarbons every day

Focus on our people
- Continue to invest in and compete for capability & skills
- Technical development
- Clear career paths
- Leverage global workforce
- Build leadership skills
- Recognition & inclusion

Deliver the plan to 2020
- Delivery never compromises safety
- Clear plans, KPI, milestones by asset
- Every team, every person understands how they contribute
- Drive efficiency, continuous improvement.
- Communicate and recognise progress

Build our future
- Leverage strong incumbent resource base
- Develop position WOS
- Invest and sustain CNS
- Strong medium term opportunity set
- 3-5 exploration wells 2017
- Active participation in licence rounds

Modernize & Transform
- Simplify & lighten the load
- Use technology to create a transformation
- Improve IT and communication equipment.
- Get our existing systems working for us.
- Prioritised technology plan for the region to identify new technology
- Transform our business culture
BP Supply Chain Process

- Direct supplier relationships for more critical activity

Supplier Engagement Matrix

- We need supply chain help to improve efficiency and meet challenges
- We’ll listen to all credible offers
Corrosion Under Insulation
The BP North Sea Challenge

Simon Moyes
BP North Sea, Engineering Services, Integrity Manager
The **Challenge**

With a broad spectrum of assets old and new across the globe and here in the North Sea, efficient demonstration of Pressure Systems and structural Integrity inspection is costly and challenging

- **Through insulation**
- **Through corrosion**

BP would like to work with suppliers beyond current technologies for a game changing answer to the overall cost of the assurance programme in this area
Large areas of insulation removal
Process safety concerns
Personnel safety concerns
Production Operations concerns
Access & Interference

- Inaccessible areas
- Lifting at heights
- Rope Access deployed
- Equipment under insulation
- Nucleonic instrumentation
BP CUI Assurance Philosophy

- Risk Based approach
  - Scheme designation 1, 2, 3, 4.
  - Full and Partial Strip of Insulation for visual inspection. A rolling 6 year partial, 12 year complete strip activity set

Identified Susceptible Target Locations across BP

- AGT; 7024
- Alaska; 500,000
- Angola; 396
- AsPac; 2223
- GoM; 2250
- North Sea; 20,000

* Data collated in Loops and features
Philosophy translated to Activity; North Sea

On average 30 – 40 people offshore executing work

On average 30 – 40 people onshore preparing and analyzing results

2016

- ~ 2000m² painted
- ~ 3,500m²/linear metres replaced
- ~ 60% ‘hit rate’ on defects found to be re-coated

• Approximately $10million spend per annum North Sea
• Approximately $60million spend per annum across the group
Assurance Programme results

• Near miss and LOPC trends*
  - AGT; flat zero
  - Alaska; decreasing
  - Angola; increasing
  - AsPac; flat zero
  - GoM; increasing
  - North Sea; decreasing
  - T&T; decreasing

*in low pressure non-hydrocarbon systems
Techniques deployed

AGT
1. Profile Radiography Computed or Digital
2. Guide Wave Testing
3. Strip all insulation and perform visual
4. Perform 100% visual inspection and selectively strip suspect areas

Alaska
1. Profile Radiography Computed or Digital
2. Tangential low intensity x-ray Radiography e.g., CMOS systems
3. Guide Wave Testing

Angola
1. Perform 100% visual inspection and selectively strip suspect areas

AsiaPac
1. Profile Radiography Computed or Digital
2. Infrared Thermography
3. Pulsed Eddy Current (PEC)
4. Strip all insulation and perform visual
5. Perform 100% visual inspection and selectively strip suspect areas
6. Perform external inspection of insulation to identify areas of staining, bulging, breakdown / damage that could result in water ingress
Techniques deployed cont’d

GoM
1. Profile Radiography Computed or Digital
2. Tangential low intensity x-ray Radiography e.g., CMOS systems
3. Strip all insulation and perform visual
4. Perform 100% visual inspection and selectively strip suspect areas

North Sea
1. Strip all insulation and perform visual
2. Perform 100% visual inspection and selectively strip suspect areas
3. Some NDT LRUT, Radiography used.

T & T
1. Tangential low intensity x-ray Radiography e.g., CMOS systems
2. Infrared thermography
3. Pulsed Eddy Current (PEC)
4. Perform 100% visual inspection and selectively strip suspect areas
BP Technology programme

- Open vision; Low energy X-ray
- Lixi profiler; low energy Y-ray
- Lyft Pulsed Eddy Current
- Eddy Current array
Request to the **supplier community**

- BP has a number of techniques deployed in the North Sea and around the globe to detect corrosion under insulation and through scab defects.
- Each technology has limiting defects that can leave gaps in assurance.
- Each technology has limiting access or personal safety limitations.

BP would like to work with suppliers beyond these technologies for a game changing answer to the overall cost of the assurance programme in this area.

- Inspection methods
- Coating types
- Insulation technologies
Subsea – Introduction

North Sea Region Portfolio

- Intro/context
  - GOO NS Subsea

- History
  - typical spend (opex)
  - typical activities (IMR, planned vs emergent)

- Current
  - S&E examples

- Future
  - planned spend & activities (opex)
  - CI focus areas

- Oil Pipelines
- Natural Gas Pipelines
- OBO Pipelines
- Shetland
- Central North Sea
- Decommissioning
• Budget £70M gross
  - Planned activities make up 60-70% of Spend
  - Emergent activity accounts for 30-40% of

• Main Areas of Spend are:
  - 1. Vessel based Inspection Repair & Maintenance
  - 2. Materials & procurement
  - 3. Subsea engineering & management support
  - 4. Topsides Inspection Repair & Maintenance
- £14M gross saved year to date across 59 ideas/initiatives
- recycled for emergent works
- cost, schedule, reputation

**Driven By:**
- Switch to more Risk Based Inspection
- Utilisation of alternative work execution methods
- Competitive tendering of workscopes where possible / appropriate
- Challenge need for & complexity of work scopes
Subsea – S&E in action - EECU

Opportunity:
- Reduce EECU structure fabrication costs through competitive tendering of fabrication scope by North Sea Ops Subsea Projects

Improvement action taken:
- EECU project completed a competitive tendering process with 6 participants for the EECU structural fabrication.
- Tender submissions evaluated with QHSE (pass/fail), technical and commercial criteria taken into consideration to determine award recommendation.

Benefit: £700k savings
- Competitive tendering process highlighted significant variation in fabrication scope cost estimates.
- Chosen fabricator have a proven track record delivering to BP requirements and proposal submitted was a fit for purpose tender in line with project specifications.
- Reference fabricator cost estimate was approx. 2 x chosen fabricator cost estimate.
- Fabrication scope was managed by core project team, minimum BP internal costs incurred.

Key learning:
- Utilise standard industry solutions.
- Provide functional requirements only.
- Maximise market conditions through competitive tendering accessing local industry capability
Opportunity:
- Reduce the amount of controls hardware procured on the Arundel project.

Benefit:
- Functionality maintained whilst reducing amount of hardware required. Saving mainly made by running the whole of Arundel from the tree SCM and not providing a dedicated manifold SCM as on Kinnoull.
- The cost of the control set was reduced from £3,500,000 to £2,000,000
- Additional cost and schedule savings also made in relation to the reduced engineering and assurance effort required to deliver the smaller controls package.

Key learning:
- Tying in infill wells to the host system can often be technically challenging. A review of the existing system architecture and functionality versus the requirement of the infill well should always be undertaken. This ensures the most effective cost, schedule and engineering solution.
Opportunity:
- Deferral of critical inspection and fabric maintenance of the Andrew Export and Cyrus Import risers from 2015 due to inability of execute work from rope access.

Action Taken:
- Installation of significant underdeck scaffold to allow access to all risers and facilitate the scope of inspection and fabric maintenance.

Results:
- Full inspection and fabric maintenance of the risers has been completed in a 8 weeks. 50% reduction in required manpower and cost. High quality of work which would have been challenging to achieve from rope access.
- Efficient use of core platform teams further reducing cost and improving efficiency. Ability to execute emerging integrity scope remediating weld defects on the gas export riser.
Help required 2017 and beyond

- Pipeline Validation Project
- Marine Targeted Inspection (Dredging, Coating, Inspection, Remedial)
- In Line Inspections
- IRM
- Pipeline Inspection (Speed Limited by CP)
- Riser Inspection (Drone Cleaning)
- Ageing equipment (valve sealing, CP Anode, Centralisers, Obsolescence)
- Condition monitoring (Riser Fatigue, Low IR)
- Hull/Structural Inspection (Crawler / Platform ROV)
Questions?
All enquiries should be addressed to;

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We will endeavour to respond to all enquiries within 30 days