Oil & Gas Authority

January 2017

SNS Well P&A Hackathon

Collective Thinking

Operators and supply chain working together
to reduce the costs of well decommissioning

Contents

Approach

The Maximising Economic Recovery (MER) UK Strategy places on obligation on all parties to ensure that all viable options are explored for infrastructure use prior to decommissioning and that decommissioning is then executed in the most cost effective way without prejudice to, and in balance with, the maximisation of value from economically recoverable reserves.

With this objective in mind, the Oil and Gas Authority (OGA) is continuing to work with the industry and in particular the supply chain to deliver a 35% decrease in the cost of decommissioning. There is an urgent need to identify new technological solutions that will bring cost efficiencies into the well plug and abandonment (P&A) market.

Well P&A accounts for approximately 60% of the overall costs associated with decommissioning in the Southern North Sea (SNS). There is therefore an enormous opportunity for the supply chain and a significant upside for both government and operators if innovative technological solutions and cost efficiencies can be uncovered and fast tracked into the industry.

To help accelerate this process, the OGA along with SNS operators, organised two industry hackathons with the principle aim of improving P&A operations, performance efficiency and reducing costs in the SNS. The focus for both these events was the spectrum of challenges associated with efficient well abandonment in the SNS.

This report provides an overview of the topics discussed, key issues raised, common themes and the solutions proposed. The intention is to provide a catalyst for greater collaboration that will help reduce decommissioning costs by bringing new technology-driven solutions to the P&A market in the Southern North Sea. All proposals and suggestions covered in this document are those collected from the event and are not presented as approved methods, standards or recommended approaches but as stimulation for further consideration.

Hackathons

The hackathon concept was selected, in discussion with SNS operators, as a way to break down existing barriers and bring different parties together in a collective, problem-solving environment. The primary objective was to encourage an open discussion focused on finding creative solutions to help reduce well decommissioning costs.

To ensure that the discussion was unrestricted, all attendees were encouraged to follow the '**SUN**' philosophy as summarised here:

Suspend pre-conceived negative ideas of subjects raised

Understand each participant's ideas and proposed solutions

Nurture these ideas and solutions to become practicable and implementable

To focus the discussion, five key topic areas were agreed. These key topics were:

Subsea

Well P&A

Cementing

Pre P&A Activity

Tubulars

Each topic was introduced by a number of background thinking prompts.

Participating Operators:

Centrica
ConocoPhillips
ENI
Ineos
Perenco
Shell
Tullow
Verus

Common Themes

Across the two hackathons, the discussion on technical issues ranged greatly, but regardless of the topic, a number of common themes emerged. These were as follows:

SUPER P&A ORGANISATION

There were numerous suggestions exploring the possibility of creating one organisation to be responsible for the abandonment and decommissioning of SNS wells – with innovative funding models developed to ensure projects are managed efficiently. It was highlighted that there would be clear cost saving opportunities to be realised if there was one organisation preparing and performing all SNS decommissioning programmes.

REGULATORY REQUIREMENTS

There was a common view among operators that the current regulatory requirements are too stringent and a general consensus that lower specifications were achievable. It was agreed that guidelines should be more flexible, transparent and risk based and that liability should be more clearly defined.

COLLABORATION AND INFORMATION SHARING

The value of and need for greater collaboration between operators was recognised across all topics. It was proposed that operators could share the costs of developing new technologies, share access to tools and vessels and share lessons learned. Most immediately it was suggested that operators could set up information sharing databases in a number of key areas.

UK FISCAL POLICY

There was much debate around UK Treasury policy and what could be changed to encourage operators to start decommissioning projects by reducing the financial burden of the initial costs.

ACCESS TO OEM (original equipment manufacturers) INFORMATION

Many operators stated that getting wellhead/tree drawings from OEMs was difficult with some OEMs even wanting to charge for this information. It was suggested that operators collectively as major purchasers could seek to make OEMs more transparent with information and in turn this could be shared amongst operators.

NEW TECHNOLOGY

There was much discussion around the need for new technology to be nurtured and the fact that for many SNS operators their decommissioning projects are too small to justify taking a risk with new technology. There is an opportunity for the operators to set up a new technology share group to try and fast track development of new tools etc.

Subsea

Background Thinking

Wells are old
Original operators no longer incumbents
Equipment is not supported
If equipment is available – who has it
Diving is not common practice
ROV tooling required
Control systems

Discussion Summary

There were 25 items raised under this topic, representing 20% of the total. Many focused on the need to improve the sharing of information between operators themselves, and between operators and the supply chain. Suggestions considered sharing the cost of developing new equipment, setting up equipment databases to share equipment and technology more openly, and vessel sharing by operators on multi-well campaigns to reduce costs. There was also a consensus of opinion that OEMs could be, and should be, more actively involved in decommissioning projects.

Ideas to Explore

1. OPERATOR WORKGROUP

Greater operator collaboration needed on subsea issues
Create and share a common database of lessons learned
Share equipment, drawings, procedures and surveys
Share the costs of research and of developing of new equipment
Investigate more use of ROVs to perform diver tasks

2. BARGE CLUB

Promote vessel sharing between operators
Commission purpose-built jack-up work barge to perform SNS P&A
Carry out tree removal as part of a multi operator campaign
Promote joint operator logging and investigation of wells to identify those which can be plugged by a rigless method and those with more complex operations which will require a rig

3. TOOLING

Operators to create a tooling database
Operators to share tooling equipment
Improve involvement of OEM in decommissioning
Operators and OEMs to share historical data
Recognise that non-OEMs can offer solutions to subsea challenges

Well P&A

Background Thinking

Limited space on platform
Fluid is a large volume issue, weight, permits, size, dumping
Pre-job data acquisition
Formation understanding not always known
Well head can be challenging
Use rigs benefits
Permits, OPEP, PON 15 / Chem permit, WONS application

Discussion Summary

In this topic, 30 items were raised representing some 24% of the total. Due to the open-ended nature of the topic there was a wide range of opportunities discussed. The general consensus again focused on sharing information and the idea of creating a single organisation to perform well abandonments was discussed at length. Similarly, there was a call for greater clarity on guidelines, and for the regulators to play a part in the planning and implementation of decommissioning programmes. There was also detailed discussion in areas such as thru-tubing logging, alternatives to cement, the benefits of rig or rigless intervention, and how best to fund and fast-track new technology.

Ideas to Explore

1. STANDARDISATION

Develop a standard system and approach to decommissioning process
Use lean techniques to refine process
Encourage early collaboration between operators
Encourage operators to share services, personnel and technology
Ensure a managed profile of wells in the future

2. ONE ORGANISATION

Create a single focused organisation to manage the decommissioning process
Reduce operator liability – and support the financial burden
Improve effective planning
Bring the P&A professionals together within one unit
Encourage anonymous data sharing of costs and verification of wells

3. FAST-TRACK THINKING

Share lessons learned on common database
Failures and non-production time to be shared
Feed all lessons learned into guidelines
Share innovation and technical advances – especially with regards to thru tubing logging
Share concepts and funding
Develop forums/groups/university bodies
There is a requirement to fast-track due to decommissioning timetable

Cementing

Background Thinking

Contamination effects
Think of the challenge simply as a barrier
Verification practices
Standards Vs engineering
Could industry develop and define good common standards
Longevity and integrity of material selection
Cementing skills, placement practices

Discussion Summary

The discussion groups produced 26 ideas or suggestions – some 21% of the total. As with the previous two topics, there were a number of similar issues raised including the need for greater collaboration and data sharing. However, much of the discussion focused on the technical aspects of the challenge and the how to improve performance – including the repeated suggestion of using the well to create an alternative barrier to cement and around the use of other materials either with or instead of cement.

Ideas to Explore

1. PROCESS CHANGE

Change the mix and have multiple layers – the triple stack
Instead of using just cement, consider using plastics and resins as well
Pump something unfriendly into the reservoir to 'gunk' it up
Monitor flow and pressure over a period of time and if OK place a mechanical cap
Consider use of thermite and rockify CO2 – melt the casing
Use the reservoir to create a barrier

2. WORKING TOGETHER

More sharing – bring knowledge and concepts together.
OGA could facilitate sharing – but operators must engage
Develop thru-tubing logging tool and share the costs
Create an industry taskforce to test different options
Work together to identify the most economic and least risk well abandonment options

3. VERIFICATION

Will a 10,000psi well ever recharge to that pressure?
Minimise the risk and lower the acceptable standards
Conduct study to estimate the rate of regional reservoir recharge

Pre P&A Activity

Background Thinking

Cranes
Deck space
Accommodation
Is suspension actually required?
Focus maintenance on what is actually required
How can we optimise maintenance in late life
Late life – CoP – decom transition

Discussion Summary

These sessions yielded the least ideas with only nine issues raised, representing 7% of the total. Once again there were calls for greater collaboration between operators, focused on sharing rigs, risks and technology development. There was also the suggestion of open book pricing and the use of shared vessels. The new technology element of the discussion focused on the use of drones and satellites to perform detailed inspections of normally unmanned installations (NUIs) and to create accurate 3D imagery to help determine design and corrosion states.

Ideas to Explore

1. BETTER PLANNING

There is a need for operators to share wells and P&A responsibility/liability
Work with the government to agree delivery
Guidelines should be flexible clear and risk based
Liability should be defined and an insurance solution sought

2. MORE SHARING

Encourage greater collaboration between all parties
Sharing risk between operators
Open book pricing
'One team' approach to sharing vessels
Early integrated planning
Create a 'big toolbox' between operators for equipment and tools
Focus on sharing tools for abandoning wells and recovering trees
Share multi-skills across operators
Share knowledge and accept responsibility for design

3. CONSIDER NEED TO SUSPEND

Clearer guidelines on why we need to suspend
Challenge integrity standards to not require suspension prior to P&A
Sub-hydrostatic wells – investigate fluid levels without intervention
Suspend – cheaper doing vessel-based approach
Full P&A – mitigate loss of data

Tubulars

Background Thinking

Currently an option to remove with jacket
Current practice is a slow process
Better ways of removing tubulars
Equipment for odd ball strings
Tubing-hanger running tool (THRT) landing strings etc
Perf and wash, plasma milling
Is blowout preventer (BOP) damage a real issue?

Discussion Summary

These sessions presented the highest number of opportunities, suggestions and solutions. Overall some 36 items were discussed or 29% of the total. It is interesting to note that the majority of the items raised were not specific to tubulars, but included further discussion on regulatory requirements, technology verification and the creation of a specialist P&A multi-service provider. Beyond these however, there was a fantastic response relating directly to tubulars and the challenges of decommissioning with the attendees putting forward a wide variety of different methods for handling tubular issues.

Ideas to Explore

1. DATA SHARE

Large amounts of data held by operators and 3rd parties
Compile a library of data on past projects with regards to casing and tubing condition
Use data to justify leaving casing in place
There are many unproven tools and techniques, some with potential to add value
Smaller operators do not want to take risk of first deployment
Share research and development costs

2. COST SHARE

Smaller operators don't have enough wells to be efficient and reduce costs
Phasing of decommissioning throughout the SNS should be considered
Phased decommissioning undertaken by a multi-service provider

3. LOGGING AND CUTTING

Cement verification; casing to be left in the ground
Efficient deployment of new technologies
Develop a through tubing solution
Use abrasive water jet cutting system for removal or section cutting for isolation
Investigate laser cutting which could perform multiple cuts at one time

The Way Forward

The SNS P&A hackathons produced a total of over 120 ideas and opportunities to reduce decommissioning costs. Of these over 30 were consider of real practical value. The next stage is to appraise these further and, along with operators, progress the best ideas. The established SNS Well Plug and Abandonment group is a starting place to channel these lessons learned and ideas, but assistance from other groups may be required to drive real change. The OGA will also consider the information gathered and work with other government and trade bodies to facilitate where applicable.

Operators will have different views on commercial risk and opportunity, but there are many lessons which can be developed and taken forward. The decommissioning environment is different to what industry has faced before, this is not business as usual and it is clear there are many good ideas within the supply chain to help operators reduce their decommissioning costs. This represents an opportunity to develop the diversity and capabilities of the well P&A supply chain, and must be embraced and supported by the operators, regulators and wider industry.

The real value of the collective thinking which shone through at the hackathons has provided a platform to build on. Action is required now in laying the foundations for a highly competitive and highly capable decommissioning sector for the whole of the UKCS.

NEXT STEPS

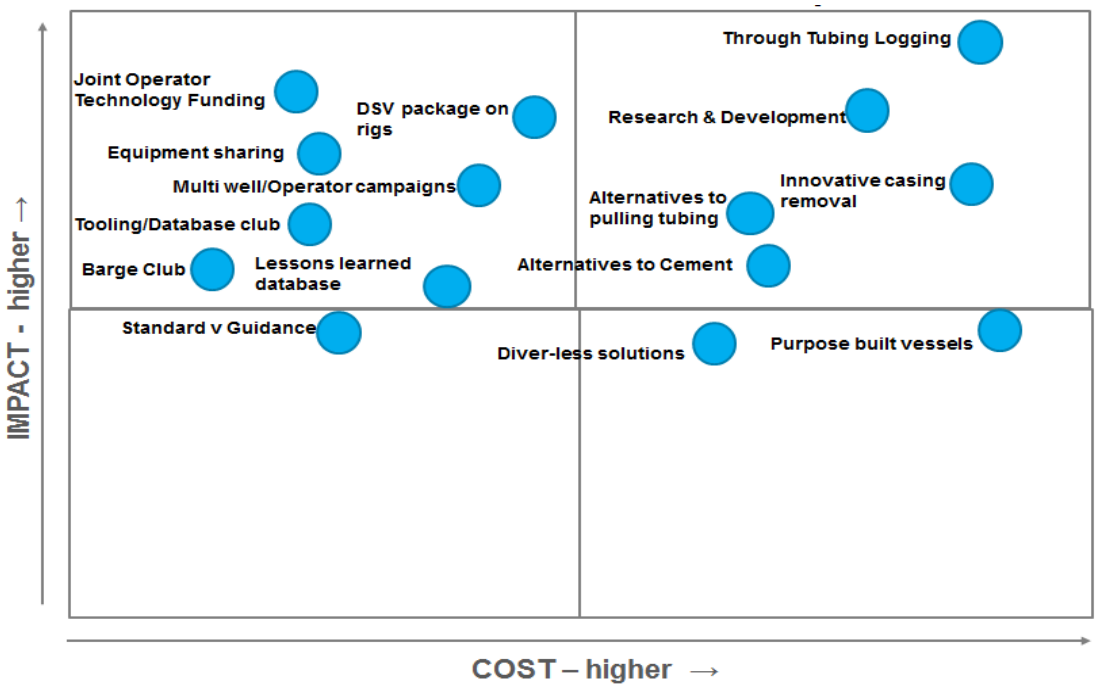
1. SNS Operators to each rank their top 3 enabling solutions

2. Workshop with the Operators to create a pathway to implement their ideas

3. Provide information from workshop to technology enabling organisations to assist developers

4. OGA will work with supply chain trade bodies to progress the top ideas

Hackathon Ideas, Costs and Impacts



Appendix

Attendees – companies

Abercus
Acteon
Advanced Forming Research Centre
Aker Solutions
Apache
Aquaterra
Archer
Ardyne
ASCO UK Ltd
Atlantic Drilling
Attollo Offshore
Aubin
Avison Consulting
Baker Hughes
Bibby Offshore
BHR Group
Blade-Energy
Calash
Cedco
Centrica
Chemring Energetics
Claxton
ConocoPhillips
Coretrax
Dataco
Decom Psi
Decom North Sea
DEME group
DNV.GL Limited
EC-OG
EEEGR
Energy Services International
ENI
EPIC International Ltd
EV Technology Centre
Exova
Expro
Film Ocean
Fraser Well Management
GA Drilling
GE
Gee-Force Hydraulics
Halliburton
High Value Manufacturing Catapult
Houlder Ltd
Ineos
Intervention Rentals Ltd
Interventek
Island offshore
ITF
LR Senergy
McCallum Engineering
Manufacturing Technology Centre
Master Marine AS
N-Sea Offshore Limited
NRG
ODE
OGIC
Oil & Gas Authority
Oilfield Innovations
OIS
Optiime Subsea Services
Paradigm

Attendees – companies continued

Perenco
Pinnacle Consulting Engineers
Proserv
Ramco
Ramco Tubular
Resolute Energy Solutions
RGU
Röchling
Röchling Plastics
Romar
Schlumberger
Score Group
Sea
Seal-Tite UK LLC
Sets Subsea Specialists
Shell
Smarter Subsea Handling
Solab
SPD/Petrofac
SPEX
Subsea Tech Services
Subsea Tek
Subsea 7
TAM International
Technip
Total E&P
TSC
Tullow
University of Aberdeen
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Vayco Oil Tools
Weatherford
Well Centric
Well Decom
Well Gear
Welltec
West Oil Tools
Westerton

Oil & Gas Authority

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