

## DECOMMISSIONING

# Leveraging new opportunities



Shell's Brent Bravo oil platform arrived at Able UK's Seaton Port decommissioning facility, Hartlepool, UK, in June 2019

Photo: ALE

**Billions of dollars are earmarked for decommissioning over coming decades, with opportunities for innovation, cost reduction, and development of skills and expertise. SPE Offshore Europe 2019 offered a thought-provoking forum for lessons learnt on best practice and key challenges. Brian Davis reports.**

## Hat-trick combo for next generation decommissioning operations

Three leaders in the oil and gas decommissioning sector launched a new company, Fairfield Decom, in June 2019, to provide an end-to-end solution for P&A, salvage and disposal of ageing oil and gas assets.

Fairfield Energy is a subsidiary of Decom Energy, who is one of the partners in Fairfield Decom, which is well advanced in decommissioning of the Greater Dunlin field (including Dunlin, Osprey and the Merlin subsea satellite fields and infrastructure), with Dutch marine contractor Heerema and specialist Norwegian offshore removal and recycling contractor AF Offshore Decom.

The combined venture claims to be the first fully outsourced, end-to-end, late-life decommissioning operator in the North Sea. 'The three companies have unrivalled

experience in decommissioning and there is great alignment in terms of our responsible approach to business and core values,' said Graeme Fergusson, Managing Director of Fairfield Decom.

The company is initially targeting the UKCS, which has the largest decommissioning market globally, with a projected expenditure of £15.3bn over the next decade.

'We have had some very encouraging conversations with operators looking to outsource their decommissioning operations to a company like ours,' said Fergusson. 'We've taken the bold step to create a company to handle full end-to-end decommissioning projects of significant scale. This is a global opportunity – but for the time being we are focused on the UKCS.'

Typically, operators put off decommissioning to the last moment given the challenges and assumed lack of return from ageing assets. However, 'decommissioning can be a genuinely exciting part of the next lifecycle for ageing basins like the UK Continental Shelf,' said Andy Samuel, Chief Executive of the Oil and Gas Authority (OGA).

It's not simply a case of removing one platform at a time. Taking a more integrated approach requires new intelligent solutions for improved efficiency and significant cost savings. Given the 35% cost reduction target mooted by the OGA, it's good to learn that that decommissioning services have risen to the challenge and achieved over half this goal in just two years. There's also a great opportunity for decommissioning experts to market their skills globally, with major capital expenditure on the horizon (see Figure 1).

A lot of the spend is focused in the North Sea, particularly on the UKCS. Last year the decommissioning sector was set to spend £1.9bn, but managed to save £0.5bn thanks to new efficiencies. Admittedly, costs and challenges vary from basin to basin. There are also significant differences between the UKCS and the Gulf of Mexico, where decommissioning is largely rigless, compared to rig-based on the UKCS which brings extra cost.

One of the key lessons is the need for 'continuity of people' in decommissioning operations,

So, how does he see the key lessons learnt on Dunlin?

'Expect the unexpected. Planning is key. We arrived at Dunlin COP very quickly and unexpectedly, when the oil price fell. There were many technical issues and the wells have involved huge learning. We tried to create an "agricultural process" around the wells, harvesting new knowledge as it was gained.'

Continuous improvement is key. However, the biggest lesson has been about organisations and led to the creation of Fairfield Decom. 'Taking on the decommissioning challenge in the traditional capex mindset doesn't work for [this sector],' insisted Fergusson. 'The frustration of three companies operating in isolated boxes meant much value is lost if you can't integrate those

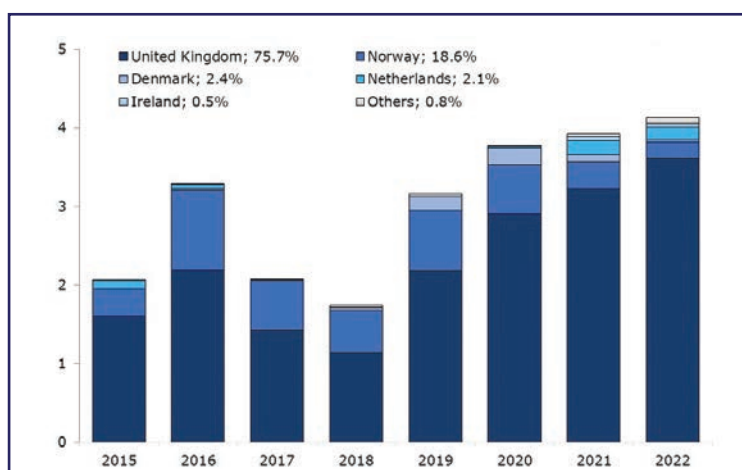


Figure 1: Offshore decommissioning expenditure, by year, in \$bn

Source: Rystad Energy

said Samuel, who cited companies like Ineos who have carried out onshore decommissioning for many years. Several service suppliers stressed it is important to move away from the traditional confrontational relationship between operators and service suppliers, which talks about 'us and them', towards a collaborative environment which means 'us'.

Samuel also highlighted the importance of getting good data and documentation early in the process. 'Digitalisation of data will be key, but the lack of data on ageing assets is a serious challenge,' he said. He also warned of the need to avoid 'reverse engineering'. 'Decommissioning is not a large engineering project necessarily. It's about removal and demolition, and requires a different mindset.'

The OGA sees decommissioning as a very positive story. Given that UK taxpayers cover about 40% of the cost, operators and service companies are seen to be moving in the right direction, with an emphasis on cost

reduction, building efficiency and continuous improvement. The OGA's first estimate, based on 2016 data forecast, is a UKCS decommissioning bill of about £60bn. Following detailed consultation with industry, there was alignment around 35% cost reduction and significant improvement has already been delivered.

The OGA finds that better transparency and clarity of data for operators and service companies is proving transformational. Each case is benchmarked. For example, platform well plug and abandonment (P&A), which started off at £3.6mn per development well, has decreased rapidly to £1mn. So if an operator is off the mark, constructive conversations can be held to drive down costs.

'Sharing lessons learnt is vital,' said Samuel. 'As a regulator, we have clear expectations and aim to cocreate with industry, with minimum-based expectations and common sense. One of the key things we are pushing is the need for early planning. We

expect operators to start planning six years before cessation of production (COP), and within three years of COP we expect their plans to be quite mature.'

### Strategic issues

'When operators discuss strategic issues, decommissioning never gets quite to the top of the list,' maintained Jon Clark, EMEIA, Oil and Gas Transition Leader at EY. 'It's always tomorrow's problem, until suddenly it's today's problem!'

Clark thinks the oil and gas sector has used 'maximising economic recovery' (MER) as an excuse to avoid talking about decommissioning, as oil and gas is not being recovered. 'However, the mindset has changed in the last two years as people think about the "E" in "MER". They want more clarity on the cost of decommissioning, what you have to do and when? Recovery and decommissioning are two sides of the same coin... and it is critical for the supply chain to invest.'

It's also important to have a clear timetable for decommissioning, 'in order to attract people to this area as a compelling career'. Clark insists decommissioning is not simply about cost reduction, but about the creation of new projects and business models. 'There needs to be multiple projects for economies of scale, improved efficiency and continuous learning. If you only work on one project, you have all the costs of acquiring that knowledge and none of the opportunities for applying it for any benefit to your organisation.'

He highlighted some of the fundamental ingredients:

- Decommissioning projects currently sit mainly with operators. 'We talk about

parties closely. Thinking about that led us to combine forces and put all of our skills in decommissioning and our value chain in one entity, so you can break through barriers as one integrated entity – that creates a lot of value and saves a lot of costs.'

Fairfield Decom Commercial Director Ronald van Waaijen added: 'The first thing we tried to stop was the traditional contractor/client relationship, which is confrontational. Our approach is smarter and trust-based.'

The team is also relatively small, with a footprint of 10–15 in Fairfield Decom, with further personnel available from Fairfield Energy, as well as a vast skill-base in Heerema and AF Gruppen. Interestingly, Fergusson doesn't expect decommissioning to become a huge job creator. 'Success will be defined by the

North Sea having efficient decommissioning through a number of models like ours. But there's only the demand for a handful of companies.'

As for new technology, 'from a wells perspective there is exciting technology out there, but it's yet to be proven,' commented Fergusson. 'Dunlin started its well campaign in 2016. We trialled a number of different technologies, none of which gave us the confidence as a responsible operator to use it for our wells. So Dunlin has been a relatively conventional P&A campaign. We have used good technology for the subsea wells that we removed. But Dunlin has not been the opportunity to demonstrate game-changing technology, like thermite plugs, bismuth plugs etc.'

However, according to van Waaijen: 'Digitalisation is important, and as a new start-up company, it's fairly easy to implement.' What's more, Heerema is to install the first lift with its new 20,000 tonne *Sleipnir* vessel, which offers a lot of sustainability, powered by LNG. Heerema also has a simulation centre in The Netherlands, where it can practice on decommissioning projects virtually and benefit from lessons learnt in a safe environment.'

So, what's the main barrier to success? Fergusson maintained: 'Lack of quality records and data is a major issue for decommissioning operations. That's why starting early is key to efficient decommissioning.' ●

having the right assets in the right hands, but it should be the 'right activities in the right hands', he said. 'These projects and the service capability should move from operators to decommissioning specialists.'

- 'We spend a lot of time talking about the physical assets but need to focus on human assets. The North Sea is changing, we are going to need different skills. Some are transferable from existing skills, but some are new. This will create challenges and tremendous opportunities,' he maintained.

'There are lessons to be learnt from the nuclear industry,' suggested Martha Vazques, Associate Director, Upstream Oil & Gas, Boston Consulting Group. She described how ownership of a 42-year old US nuclear plant was permanently transferred recently, with its licence and decommissioning liability, to a company called Northstar. The same operator sold another nuclear plant to specialist spent fuel contractor Haltec, for end-to-end decommissioning among several similar contracts.

She noted: 'This is an unprecedented level of innovation in a very conservative industry and was a significant change in perspective. Neither Northstar nor Haltec have any previous end-to-end decommissioning experience of nuclear reactors. But the concept works for every party.' Vazques suggested that the UK decommissioning industry should look closely at this example of outsourcing.

'Today the UK decommissioning facilities are mostly fragmented. Most of the contractors are traditional oil and gas service companies. And the specialist contractors are taking time to get traction,' she said.

So, what would exploring decommissioning from a different angle look like? Starting with the scope for subsea well P&A, Vazques said cost savings of about 15% could be achieved, given a reasonable split of 100 well P&As into several clusters in the northern North Sea, with further clusters in the central North Sea and so on. 'Well scopes need to be larger, generally,' she remarked.

Furthermore, decommissioning should be outsourced to greenfield decommissioning units, with mandate on budgets and tailored processes. She would also like to see various operators come together to collaborate.

## Decommissioning of Brent Bravo and Shell Ostar dispute

Decommissioning the Brent field complex, 186 km north-east of the Shetlands, is a complex, major engineering project because of its size, age, infrastructure and the harsh environment. The complex comprises the Brent Bravo, Charlie and Delta platforms and Alpha steel jacket, and is a 50:50 joint venture between Shell, as operator, and Esso.

Brent Charlie ceased production in 2011, Alpha and Bravo in 2014, and Charlie is still in production. The Delta platform was removed in a single lift in 2017 by Allseas's vessel *Pioneering Spirit*, and taken to Able UK's facility in Hartlepool, where over 97% has been recycled. Brent Bravo's 25,000 tonnes topside was lifted in June 2019 by the *Pioneering Spirit*. The one-piece lifting operation took four hours, from its initial position on top of the concrete legs, 140 metres deep.

The German government has made a formal objection to Shell's plans to leave the huge concrete legs of three of the four Brent platforms in place in the North Sea. Both countries are signatories to OSPAR, an international agreement with several European countries, which calls for complete removal of offshore structures once they reach the end of their production cycle, if possible, to protect the marine environment. Shell is seeking derogation from full removal, arguing the safety risks associated with trying to remove concrete structures for the Brent Bravo, Charlie and Delta platforms outweigh the 'minimal environmental benefits'. ●

'Decommissioning is not a time for competition. We need a serious change in perspective. Not looking at decommissioning as a liability for each individual operator, but as a serious opportunity that we can optimise at basin level.'

### New models

'Almost \$12bn was spent on decommissioning around the world and a similar amount is projected to be spent over the next three years,' said John Hand, Technology Programme Manager, ConocoPhillips. 'This is a big opportunity, but is challenging because we are dealing with unique wells which are 20–40 years old. Sometimes records are right, sometimes not. And there is a lot of risk around well P&A, financial and environmental risk.'

Hand recommended that the decommissioning industry should learn from the example of US unconventional, in terms of agility, technology, innovation and continuous improvement.

'You don't have the same opportunity in the offshore environment as a single operator. But service operators can start developing that approach, if operators will allow them to use the data in a more collaborative environment. Small well gains can create big wins. With hundreds of wells you can get big wins very quickly, while also creating a continuous learning environment.'

Transformational changes are also important, along with continuous improvement. 'We see risk-based P&A as the best way of driving transformational change,' said Hand.

He suggested using a rig-less approach to P&A, with multi-string logging. Planning must be more purposeful, with the right equipment for the right job and

new technology, like advanced laser cutting, rock-propelled plasma, and fit-for-purpose barriers with plugs using different materials such as bismuth alloys and silicone rubbers. 'For continuous improvement you need to climb the learning curve with transformational technologies and processes to achieve 20–40% reduction in P&A.'

Pamela Lomoro, Decom Project Manager at the OGTC also emphasised thinking out of the box, with strong collaboration and innovation, as well as engaging with other industry sectors, like nuclear, defence and medicine. Lomoro also mentioned the value of digitalisation in decision making, and the recent acquisition of a UKCS simulation suite which will be available at the OGTC Decom Centre in 1Q2020.

Caroline Lawford, Decom Project Leader of CNR International, described lessons learnt from decommissioning of the Murchison and Ninian Northern platforms. She emphasised the need to attract and develop the right people for decommissioning projects. 'It's really exciting engineering. You need a diverse group of people with team spirit, and strong technology development as you strive for continuous improvement. The key factors are cultural alignment with companies involved and fun!'

Evidently, success in decommissioning will depend on a heady recipe of collaboration, transformational technology, digitalisation, early planning, continuous improvement, and learning and 'fun'. ●