BRENT E-NEWS

SHELL BRENT FIELD DECOMMISSIONING PROJECT

ISSUE #16 MAY 2016

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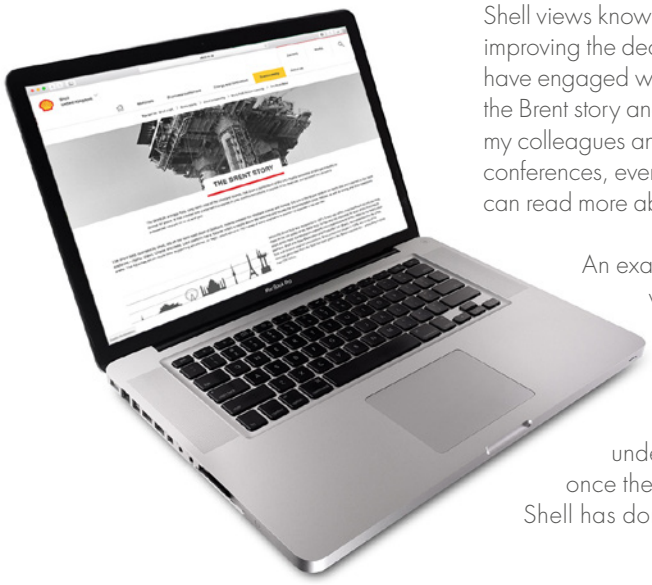
www.shell.co.uk/brentdecomm

A WORD FROM DUNCAN

Welcome to issue 16 of Brent e-news.

In this issue we will share our latest offshore progress, explore how we are sharing our knowledge and key learning with other colleagues in the industry and tell you about an exciting project where Shell has been able to support the Deeside Railway. We will also update you on our refreshed website which is one of the main resources for all Brent updates and project information.

In 2016 we are looking ahead to a busy period when the team will be visiting stakeholders to discuss project findings; this follows on from engagements last year which concluded with our Cell Management Stakeholder Task Group (CMSTG) plenary event in November where the detailed analyses of the cell sediments were discussed.



We also plan wider communications later in the year.

"SHELL VIEWS KNOWLEDGE TRANSFER AS KEY TO IMPROVING THE DECOMMISSIONING INDUSTRY AND HAVE ENGAGED WHEREVER POSSIBLE TO SHARE THE BRENT STORY AND LESSONS LEARNED."

If you would be interested in meeting to discuss our Brent Field decommissioning proposals, I would be happy to hear from you. You will be able to get in touch with the team via the 'Contact us' link on the website.

Shell views knowledge transfer as key to improving the decommissioning industry and have engaged wherever possible to share the Brent story and lessons learned. Alistair, my colleagues and I attend many industry conferences, events and seminars and you can read more about this later in this issue.

An example of creative reuse was demonstrated recently by the Deeside Railway who contacted Shell to ask if they could use the underdeck runway beams, once they were no longer needed. Shell has donated the beams and they will be made into two bridges. Read the dedicated article later in this newsletter to find out more about this creative reuse opportunity.Finally, please note the refreshed content on our website. The site is constantly evolving with new content, videos and images added as often as possible to ensure that new information is available and that we can keep you up to date with our activities. In 2016 this will be a more regular feature. Our aim is to capture the decommissioning work as it happens.

You will see that new material such as an image gallery and videos from the Brent team have already been added. I hope that you will find this information useful and informative.

Duncan
Business Opportunity Manager

ONE-TO-ONE ENGAGEMENT

If you would like to be briefed one-to-one on any aspect of the Brent Decommissioning Project's developments, or would like to raise any particular queries or issues with the Project team, please contact us at www.shell.co.uk/brentdecomm or you can also get in touch with the team via the 'Contact us' link on the website.

A WORD FROM ALISTAIR

There has been a lot of activity both on and offshore from an engineering perspective since our last newsletter at the end of 2015.

Our key focus for Brent Delta remains the preparation for the topside lift.

We are working closely with Allseas, who we have commissioned for the heavy lift of the Brent Delta platform using the *Pioneering Spirit* vessel. Allseas have advised us that the topside lift is now expected to take place in Summer 2017. The lifting of the Brent Delta topside is not specifically time bound, and Shell has always been clear that the lift will only take place when the topside, vessel, and Able UK Ltd. Seaton Port yard are ready, and all necessary permits and consents have been granted.

Our attic oil techniques will use innovative technology adapted specifically to remove the small portion of oil trapped at the top of the cells on Delta. During the winter period, large baseplates, which are almost 2.5 metres in length were installed 80 metres under the sea onto the top of Delta's storage cells, each of which stand 60 metres tall by 20 metres wide.

Onshore System Integration Testing (SIT) for attic oil methods was completed in early March near Inverurie in Aberdeenshire, Scotland – I met with a representative from Oil and Gas Authority (OGA) at the testing to view this new technology and we also took the opportunity for a site tour.

Readiness for the topside lift is going well and one of our key aspects is the production and installation of shear restraints. These are the giant clamps that will be added to the legs prior to the lifting of the platform – you can read more about the shear restraints later in this issue of e-news.

On Bravo our focus has been on plugging wells. This is one of the most significant areas of activity for any decommissioning project, and industry data suggests this typically accounts for 40% or more of all expenditure. Using the lessons we have learned from Delta we have generally been able to apply great time and cost savings to our operations on Bravo. This is experience that we have shared both internally with colleagues in Shell and with others in the industry.

The team who has been working on plugging activities have been operating on the platforms since 2008. Many lessons have been learnt which have been invaluable. In this e-news we will share some examples as well as details of where representatives from the team have been to recently to engage more broadly about the project.

Alistair
Project Director

"READINESS FOR THE TOPSIDE LIFT IS GOING WELL AND ONE OF OUR KEY ASPECTS IS THE PRODUCTION AND INSTALLATION OF SHEAR RESTRAINTS."

SIT site tour

CONTACT US

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BRENT DELTA SHEAR RESTRAINTS

In issue 15 of Brent e-news, we updated you on our extensive offshore activities. This detailed the installation of eight giant cruciform points which Allseas will use as lifting points for the *Pioneering Spirit* vessel to execute the Brent Delta platform single lift.

Successful installation was completed over the winter and some of the surplus equipment has been donated to the Deeside Railway which you can read about elsewhere in this newsletter.

Now the offshore focus has moved to reinforcing Delta's three legs, each with a diameter of almost 12 metres – about the same size as three small hatchback cars nose to tail – ahead of the lift.

The steel ring shaped restraints are being attached to the inside of each of the platform legs ahead of the cut and lift operations in order to provide additional strengthening provisions. Each ring will weigh approximately 35 tonnes when fully installed, the equivalent of five double decker busses.

Shell's Brent engineering team has worked on the design of the rings in conjunction with civil engineering specialists.

Production of the high grade steel restraints commenced in the small Aberdeenshire town of Huntly in November last year and by early March, the giant rings were ready for transportation. A trial assembly was undertaken onshore; as transportation of the rings offshore necessitated the rings to be sent in smaller segments, it was vital that they could be pieced together perfectly on arrival and after a successful onshore trial, they were ready to be shipped offshore for installation.

The journey took the rings from the manufacturer to Aberdeen where they were transferred to a vessel before being shipped to the platform. Once offshore a team securely fitted them to the inside of the legs – no mean feat considering the size and weight of each component. The work also had to be conducted within the confines of a 40-year-old platform leg in the middle of the North Sea.

The first full installation was completed at the end of March with the other two rings transported and installed in April.

Project Engineer Eric McWilliam described the work as unique. *"On the surface, this sounds quite a simple project and we have had a really fast turn-around, but the work is very specialist and occurs in tight spaces, to precise specifications and challenging conditions. To see the first successful installation was a great triumph."*

The lessons that we have learned from the installation of these restraints on Brent Delta will be captured and shared with the team ahead of similar operations on Bravo.

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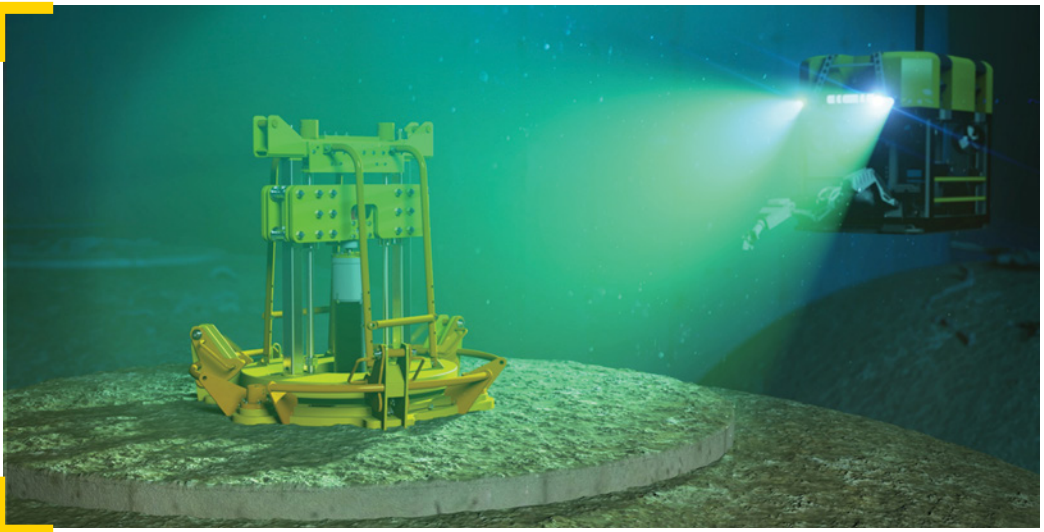


BRENT DELTA ATTIC OIL RECOVERY

There is a small portion of oil within the top dome of the Brent Delta cells. The oil cannot be recovered with the internal process piping due to the design of the cell outlet piping and the fact that oil is buoyant on water.

Operations to recover the attic oil will be conducted offshore using Remote Operated Vehicle (ROV) technology. A hole will be drilled in each cell and oil will be extracted using flexible piping system where it will be temporarily gathered into one storage cell for removal by ship.

Project Engineer Chris Morris explains "*The design of the Delta cells allowed a portion of oil to be stored above the oil export pipe. With our technique we are going to access the cell via a hole drilled in the top and then we will combine the oil into one cell before going back to collect it.*"

Shell's attic oil operations have been ongoing since 2014, after the cell survey project surveyed three of the cells.

Safety is Shell's top priority so operations have been designed to eliminate the use of divers, placing greater emphasis on ROV operations.

Each piece of equipment has to be expertly guided into place by a team of ROV 'pilots' who work on rotational shifts.

Individual baseplates allow for the operations to take place and are required on each of Delta's 16 cells.

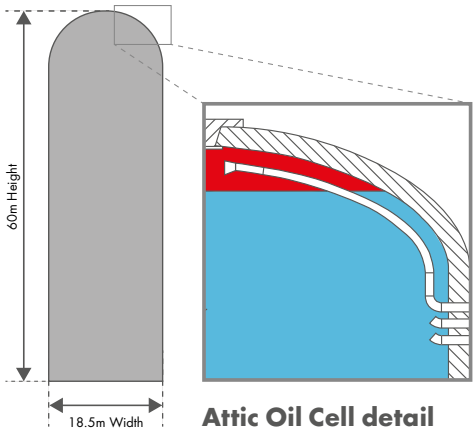
Anchor hubs form a connection into the concrete cell tops via the base plates and provide a seal – they prevent flow of the attic oil outside the cell. This is where the other tools connect into the pump so that the oil can be extracted via the piping system.

The offshore crews supporting the attic oil project are working 24/7 with support from around 25 personnel.

Activities have been gathering momentum since early in 2014 with successful deployment of the first baseplates in autumn 2015.

In March 2016, Project Director Alistair Hope met with the Decommissioning Manager for the Oil and Gas Authority, John Ibbotson, to tour test facilities in Inverurie.

The next phase of the project will see the amalgamation of the oil commence offshore and at a later date, retrieval of the oil from the last cell.



Attic Oil Cell detail

Alistair Hope says "*We have reduced safety exposure with the method we are using and the team has shown innovative thinking in their approach. The work has taken place in an impressive time for an operation that has not been done previously. Together, the team has done a great job.*"

HOW RESEARCH IS SUPPORTING THE BRENT DECOMMISSIONING PROJECT

From the start of the Project in 2006 it was always understood that the Decommissioning of the Brent field was going to take some time! Project Director Alistair Hope has been focused on ensuring the team has had access to the best available research data and the most current relevant technical studies.

"Decommissioning Brent poses many complex engineering challenges and dilemmas, and we needed to be certain that we had explored every option", said Alistair. "It was clear that research programmes could help in progressing our understanding, and inform the development of solutions and recommendations, based on sound and verifiable science".

"We have always been open about the lessons that were learned from the proposed Brent Spar decommissioning in 1995. These included the importance of early, and very broad stakeholder engagement and the requirement for sound science which has been independently reviewed. Recognising that it would be unlikely that many of our stakeholders would have the expertise to analyse the details of project specifics, Professor John Shepherd was invited to establish a group of leading academics – The Independent Review Group (IRG) – to review the various studies that Shell would undertake to enable it to prepare for decommissioning of the Brent Field." So far the IRG has reviewed over 300 major reports, maintaining its impartiality throughout.

The project has commissioned a wide range of studies covering a diverse range of topics including cutting, lifting, and environmental impacts.

Brent has also benefitted from Shell's long term strategic relationship with NERC (Natural Environment Research Council) who are now focusing on decommissioning as an emerging area for innovation. In 2015 the team worked closely with NERC in developing their call for collaborative decommissioning research projects focused on partnerships from academia and the oil and gas industry.

"Within the project, we have set up a working group to co-ordinate and drive the strategic direction of our research activities" said Alistair. "Currently we are involved in some very interesting research programmes, either directly or indirectly, and we are looking ahead to understand what data or technologies might be available to us in the future, perhaps for improved long-term monitoring, or better understanding of the ecology of the North Sea. Collaboration and cooperation with world-class academic institutes has to be the way ahead".

"I am looking forward to the results of the pipeline surveys, where Shell is supporting Marine Scotland in investigating the influence on habitats, using four Brent pipelines as part of the study, and the work we have commissioned from SRSL (the commercial research service of Scottish Association for Marine Science) looking at the possibilities of enhanced habitat recovery on Gravity Based Structures."

"Although we are bound to using Best Available Technologies for the development of our Decommissioning Programme for Brent, there is always a requirement to monitor the future direction and developments in R&D.

We have to think about the applications of Autonomous Underwater Vehicles, and other similar emerging technologies that could be available for monitoring, inspection and sensing programmes well into the future. Technical innovation has been key to our decommissioning strategy so far, and I am sure it will continue to be so as we move into the execution of our DP in the years to come."

SHARING OVER 10 YEARS OF PROJECT LESSONS AND EXPERIENCE

Since 2006, Shell's Brent Decommissioning project team has engaged with the regulator, industry bodies, other operators and the supply chain to share project lessons and experience as is lawfully possible. With only around 10% of fields in the UK Continental Shelf (UKCS) having submitted their decommissioning proposals to date, the UK offshore decommissioning industry is in its relative infancy.

When Shell first announced that it was to begin decommissioning the Brent field a decade ago, the company committed to share its key learning.

In the last 12 months, representatives from the project have visited Norway, Malaysia and the USA to share experiences at various conferences and decommissioning forums.

"*Having been at the forefront of the industry during commissioning, the field is now amongst the first reaching the end of its productive lifecycle*", said Duncan Manning, Business Opportunity Manager for Brent.

"*By sharing the lessons we have learnt on Brent, we can help others develop their proposals and they can see how Shell used innovative technology to undertake this work. A lot of interest has been shown in the Brent decommissioning process with many people seeking to understand what we are going through. Similarly, we have appreciated the opportunity to learn from operators who also have large topside facilities and concrete gravity base structures.*"

With a core team of almost 50 people over 10 years, the Brent team has a considerable bank of accumulated knowledge to share.

"...A LOT OF INTEREST HAS BEEN SHOWN IN THE BRENT DECOMMISSIONING PROCESS WITH MANY PEOPLE SEEKING TO UNDERSTAND WHAT WE ARE GOING THROUGH."

In 2015, Shell hosted the International Association of Oil and Gas Producers (IOGP) meeting in Aberdeen. This followed attendance at the Norske Petroleumsforening (NPF) – a conference the project has attended regularly since 2006 when the Brent Flare was presented. At last year's NPF conference, Project Director Alistair Hope once again gave his annual progress update on the decommissioning of the Brent field.

Former Brent Decommissioning Execution Manager Paul Smy returned to his roots and travelled to both Houston and Kuala Lumpur in February and March 2016 where he was able to share some learning as part of his new role in Shell's global decommissioning team.

"*Brent is one of those projects that everyone in the industry is interested in – there is just so much knowledge to share and people can learn from the real experiences that we have been through as we look into the best way to decommission", said Paul. "That, coupled with the fact so many people have worked on Brent at some point in their career, is what makes it different.*"

Looking ahead, the team will continue to share the work done on the project ahead of submission of the decommissioning programme.

RIGS TO RAILWAYS

Railway enthusiasts and ramblers alike are set to benefit from Shell's Brent decommissioning project thanks to a donation of several large steel beams.

The beams, used originally to aid the installation of giant lift points on the Brent Delta platform ahead of removing the platform's topside in one lift have been handed over to Deeside Railway following a request from one of its volunteers.

The steel beams will be used to construct two new bridges in the Deeside area – a footbridge for pedestrians and cyclists and a second for trains.

Richard Hamlet, who is Lead Technical Safety Engineer for the Wood Group on the Decommissioning Services Contract, made the request for the beams. In his spare time he acts as Treasurer of the Royal Deeside Railway Preservation Society and volunteers at the railway.

"*I noticed that the steel beams had been earmarked for melting down following completion of the underdeck work on Brent Delta. It occurred to me that they would be perfect for constructing the bridges we need as part of our extension work,*" said Richard.

"*The railway is a 100% voluntary organisation. While income from ticket sales and special events covers operational costs of the locomotives and rolling stock, we rely on donations and grants for our expansion work. The donation of the beams from the Brent decommissioning project is a major contribution to extending the railway.*"

Richard and his fellow volunteers are restoring the Deeside Railway along part of its original trackbed. The Deeside Railway once travelled from Aberdeen to Ballater, but its tracks have since been removed and the path opened as a well-used public walking and cycling track.

While in operation, the railway was used by the British Royal Family to travel to their Scottish retreat at Balmoral. The Royal Deeside Railway Preservation Society is using part of the way to build a heritage railway.

The steel beams from the Brent Delta platform will be used to build two bridges: a 17-metre footbridge and a railway bridge. The footbridge will be for users of the Deeside Way and will cross the Burn O'Bennie in Banchory, running parallel to the existing railway bridge. The second bridge will enable the railway to expand eastwards towards Drumoak and will cross the service road to the Milton of Crathes craft village.

"THE DONATION OF THE BEAMS FROM THE BRENT DECOMMISSIONING PROJECT IS A MAJOR CONTRIBUTION TO EXTENDING THE RAILWAY."

Alistair Hope, Project Director for Brent Decommissioning, said: "*We're delighted to be able to donate the runway beams from the Brent Delta underdeck work and give them a new lease of life. Ultimately Shell's aim is to recycle 97% of the Brent Delta topside so it's great to start as we mean to go on.*"

CONTACT US

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