

# BRENT E-NEWS

## Brent Decommissioning Project

Welcome to the eighth in the series of regular communications from the Brent Decommissioning Project Team

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[www.shell.co.uk/brentdecomm](http://www.shell.co.uk/brentdecomm)



# BRENT

## Defining, engaging and collaborating

An update with Austin Hand, Project Director



*Cross-learning within our industry is becoming increasingly important and we have been sharing the decommissioning challenges we face...*



In this e-newsletter we highlight three topics for discussion.

The first is the sometimes forgotten challenge – the Brent facilities that are on the seabed (“subsea scope”) – which is explained by our senior subsea engineer, John Ironside.

Secondly, cross-learning within our industry is becoming increasingly important and we have been sharing the decommissioning challenges we face, in particular with counterparts in Total, ConocoPhillips and BP who have decommissioned Frigg, Ekofisk and North West Hutton respectively. Operators have identified common challenges associated with gravity base structures (GBS) and we are now participating in a GBS “Owners Group”, where we share technical and HSE learnings. One of our representatives, John Gillies, has an update on this group’s activities.

Finally, we have been involved in stakeholder engagement since 2007 and the most recent events in London and Aberdeen were very helpful and constructive from our point of view. We thought we would give you some feedback from those sessions, both from the perspective of our stakeholders and The Environment Council, who facilitate the engagement process.

Austin Hand  
**BRENT DECOMMISSIONING PROJECT DIRECTOR**

### CONTACTUS

For further information on the Project, please visit [www.shell.co.uk/brentdecomm](http://www.shell.co.uk/brentdecomm) or, you can also get in touch with the team via the ‘**Contact Us**’ link on the website.



# BRENT

## Subsea Scope

### No less of a challenge

*Unlike the four gigantic Brent platforms, the field's subsea facilities 140 metres below the surface are well out of sight – but they are certainly not out of mind. Here, we focus on the scope and challenges of decommissioning the highly-complex infrastructure of pipelines and other facilities that populate the seabed around Brent Alpha, Bravo, Charlie and Delta.*

Given the variety of challenges associated with the Brent project, it's not surprising that the decommissioning of Brent's subsea facilities has received less coverage to date. Nevertheless, the challenges are considerable. Subsea facilities team leader **John Ironside**, who led the "souk" session on this topic at the Aberdeen and London Brent decommissioning stakeholder events in September, sets the scene:



Brent is a large field and the amount of subsea facilities to be decommissioned is significant. There are **32** pipelines, ranging in length from 0.1km to 36km; four subsea structures weighing more than **100** tonnes each, and up to **600** concrete mattresses (used to provide pipeline protection) with a total estimated weight of **2000** tonnes, as well as the seabed debris – such as scaffolding poles lost overboard – which has accumulated during **35** years of operation.



### Regulatory Requirements

Pipeline decommissioning in the UK is regulated by the Petroleum Act 1998.

The Act requires that each pipeline must be considered individually. If reuse is not an option, all feasible decommissioning options should be considered and a Comparative Assessment (CA) made to support the recommended decommissioning option. In Brent's case, reuse of the pipelines has been assessed by the team and is not considered a viable option.

The subsea structures, (i.e. other than pipelines) comprising a 2-part cover/manifold, an subsea isolation valve (SSIV) structure and a 2 valve structure, fall within the OSPAR 98/3 definition of steel or concrete installations. However, all Brent's subsea structures fall below the 10,000-tonne threshold and are therefore not candidates for derogation and will be removed.

Mattress over 30" pipeline



For definitions please see the Glossary of Subsea Terms at the end of the newsletter



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## Subsea Scope

### No less of a challenge

**7** of the flexible flowlines, umbilicals and cables (total 8.8km) are to be recovered by reverse reeling (these lines are currently lying exposed on seabed)

**3** of the rigid pipelines, **1** of the umbilicals and **1** cable (total 39km) are to be left in their existing trenches

**2** rigid pipelines, **2** flexible flowlines and **1** umbilical (total 7km) are to be recovered by cut and lift

**1** flexible jumper (0.1 km) is to be left within existing rock dump

The quantitative comparative assessment process, which covers 14 of the Brent field's 19 rigid pipelines, is still ongoing. There is no simple solution for the decommissioning of these concrete-coated pipelines – and there is no precedent on this scale. One of the biggest challenges is to ensure that any removal process does not compromise the concrete coating and create a safety or environmental hazard. For shorter lengths of pipeline both recovery by 'cut and lift' and 'leave in place' options are still being assessed. 'Leave in place' encompasses a range of options including trenching of the whole length of the pipeline; leaving them on the seabed, but removing any risks associated with the exposed pipeline ends by trenching them; leaving them as they are now, connected at the GBS or jacket; or rock-dumping them.

**To support the comparative assessment process, a number of studies are ongoing.**

#### These include:

- a pipeline degradation and longevity assessment
- an assessment of the safety risk to fishermen from pipelines left in place
- a soils and trenching investigation
- a rock-dumping options assessment
- an assessment of the environmental impact from pipelines decommissioning, as part of the project's overall Environmental Impact Assessment.

#### Other Subsea Challenges

The Brent field's four 100+ tonne subsea structures comprise some large subsea valves, a pipeline end manifold, its protective cover and another large check valve and associated pipework. The use of a heavy lift vessel or large construction vessel for their removal and recovery is the methodology currently being explored. This will involve a very strong focus on safety but is anticipated to be a practical option.

Mattresses on subsea pipeline



For definitions please see the Glossary of Subsea Terms at the end of the newsletter

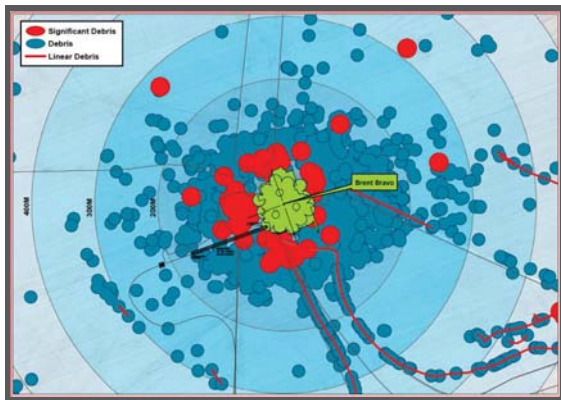
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## Subsea Scope

### No less of a challenge

The same cannot be said for the hundreds of concrete mattresses, which are required to be removed if it is safe and efficient to do so. Potential degradation of the mattresses means that their removal carries safety risks. During the decommissioning of the Brent South subsea development in 2005, the degraded condition of concrete mattresses in this area proved so challenging that they were rock-dumped instead of being recovered from the seabed.

Debris around base of Bravo



Additionally, a sonar survey of the Brent field in 2006 identified what appeared to be debris scattered within the 500 metre zones of the four platforms. This was confirmed during 2011 by an ROV survey of Brent Bravo and Delta, which clearly showed clusters of dropped scaffold poles in the platforms' vicinity. A similar survey of the Brent Alpha and Charlie 500m zones is planned for this year.

Studies are being carried out into how the concrete mattresses and debris can be safely and efficiently dealt with.

Other ongoing subsea facilities work includes a study into the detailed pipeline

cleaning requirements and constraints, and the preparation of detailed schedules and costs.

The results of all the studies conducted by the project team will help inform the final recommended options for decommissioning the subsea facilities, which will be built into the project's overall Decommissioning Programme.

#### Working With Others

Aside from working on these main challenges, John and his team are also keeping in close contact with Shell teams focusing on other projects that have an impact on the Brent field. These include the Penguins redevelopment project – Penguins is a subsea development of an oil field to the north of Brent, whose main export lines, which feed into Brent Charlie, will have to be removed prior to the decommissioning of the platform, and the Brent bypass project, which will effectively remove Brent's role in receiving gas as part of the FLAGS, Northern Leg and Western Leg gas export pipeline routes to the UK mainland, by bypassing the field with new pipeline shortcuts.

The team are also interfacing with other neighbouring operators whose facilities will be affected by Brent decommissioning.



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## Tackling GBS Issues North Sea operators unite



Shell and ExxonMobil are participating in a re-formed industry group examining the common issues and challenges relating to the decommissioning of gravity base structures (GBS) in the North Sea.

The GBS Owners Group – whose members also include Fairfield, Statoil, BP and Total – falls within the scope of the Decommissioning Committee of the International Association of Oil and Gas Producers (IOGP) – a unique global forum whose members identify and share best practices to achieve improvements in every aspect of health, safety, the environment, security, social responsibility, engineering and operations.

IOGP, along with a diverse range of stakeholders from across Europe, has observer status at OSPAR Commission meetings.

The GBS Owners Group was re-formed in 2010 to create a common industry voice in

the lead-up to the OSPAR 2013 Revision of Decision 98/3. Decision 98/3 effectively required the removal of all decommissioned structures from the North Sea. The industry can seek derogation for GBS structures and steel jackets over 10,000 tonnes, in recognition of the practical difficulties of the removal of GBSs and footings of large steel jackets.

Shell is represented within this group by two individuals. Firstly **Bob Hemmings**, the Brent Decommissioning End of Field Life Discipline Lead who, within the group, represents wider decommissioning issues for Shell. The Brent Decommissioning Project Execution Manager **John Gillies** has the role of representing solely the Brent Decommissioning Project. John explains:

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## Tackling GBS Issues North Sea operators unite



There are 28 GBSs in the UK and Norwegian sectors of the North Sea. We recognised that rather than each operator tackling the issues associated with these structures individually, it would be sensible and prudent for us to work together and share knowledge so that the industry can speak with one voice on an issue where there is potential for divergence of thought. This not only helps us in planning our individual decommissioning activities, but also makes it more efficient and effective for those who want to engage with us, particularly since we cross sector boundaries by representing companies operating across the whole of the OSPAR North Sea region.



One of the first tasks of the group has been to update a GBS information document originally produced by OGP in the early 2000s. The revised document, which is expected to be completed by mid-2012, will describe all the issues associated with GBS decommissioning, discuss the range of options identified, and set out the group's recommendations. Its purpose is to give all interested parties a basic understanding of the facts associated with GBS decommissioning.

John reports that there is a great deal of learning coming out of the GBS Owners Group.

One early example involves the idea to adopt a more holistic approach to the issue of marine collision risk in seeking derogation to leave GBSs in place.



We have realised that it may not make sense for each operator to seek derogation one by one. Together with other operators and stakeholders we need to look at the "bigger picture" for marine users from collision risks associated with the overall numbers of GBSs that will be left behind in the North Sea.

We therefore believe that integrating our approach on this issue is the best way forward and we have identified this significant piece of work as a priority.





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## Tackling GBS Issues North Sea operators unite

### About OGP

- The International Association of Oil & Gas Producers (OGP) encompasses most of the world's leading publicly-traded, private and state-owned oil and gas companies, industry associations and major upstream service companies. OGP members produce more than half the world's oil and about one third of its gas.
- Currently chaired by ExxonMobil
- In July 2010, OGP's Management Committee approved the formation of a new Decommissioning Committee. Its aim is to address the increasing pace of decommissioning activity around the globe and the need for OGP members to gain and share information.
- The Decommissioning Committee has four focus areas:
  - Benchmarking of activity to develop a better understanding of project planning and execution, and impacts on cost and safety
  - Building decommissioning experience into the design of new facilities and wells
  - Working closely with governments and the scientific community to understand the environmental implications of decommissioning and to develop appropriate environmental legislative frameworks
  - Identifying which technologies add value to the decommissioning process and where new technologies need to be developed.

[www.ogp.org](http://www.ogp.org)

### About OSPAR

- OSPAR is the mechanism by which 15 Governments of the western coasts and catchments of Europe, together with the European Community, cooperate to protect the marine environment of the North-East Atlantic.
- The work of the OSPAR Commission is formally governed by the Rules of Procedure of the OSPAR Commission. Work to implement the OSPAR Convention and its strategies is taken forward through the adoption of decisions, which are legally binding on the Contracting Parties, recommendations and other agreements.
- The observer organisations play an essential role in the OSPAR Commission. They include other intergovernmental organisations working in similar fields, and international non-governmental organisations. The non-governmental observer organisations are environmental protection and nature conservation organisations, industry and trade organisations and organisations of regional and local authorities.
- While the primary responsibility of carrying out the OSPAR Convention lies with the Contracting Parties, the observer community plays an essential role in the promotion of protecting and conserving the North-East Atlantic and its resources. The observers not only take part in the various meetings of the OSPAR Commission but also contribute actively to its work and to shaping policy development. In this way non-governmental organisations are essential partners in the implementation of the Convention and translating its principles into practical action at local, national and regional level.

[www.ospar.org](http://www.ospar.org)

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## Feedback from the 2011 Dialogue Events Stakeholder views

*Feedback from our latest Aberdeen and London stakeholder dialogue sessions in September 2011, tells us that participants are generally satisfied with the way we engage with them and that they are keen for regular updates on our progress and rationale in focusing in on our Brent Decommissioning Programme recommendations. Here, facilitators from The Environment Council, Suzannah Lansdell and Erica Sutton, share their own perspective on the events and provide a snapshot of some of the views expressed by stakeholders who attended.*

**Suzannah Lansdell** from The Environment Council shares her reflection and comments:

“A big challenge in holding these kinds of events is always how to provide the range and depth of information people want to hear about. Last year, some of those who attended for the first time found they had to fathom their way through a range of topics. This year, as well as offering an induction on the day of the event, Shell held two webinars<sup>1</sup> in advance, which gave participants who hadn't attended before an overview of the basic information about what the Brent decommissioning project comprises, where they are in their thinking, the status of the ongoing studies and the time table going forward. They also, in 2010, introduced a web-based follow-up process so that people unable to attend the events can see the presentations and videos online, and have the opportunity to make comments.

Something that shouldn't be forgotten is that some stakeholders are aspiring to 'clean seas', and so any plan that leaves something

behind will be a compromise of some sort – i.e. stakeholders would be satisfied on a practical level, rather than wholly satisfied. But I think people are prepared for this, as long as they are told what the rationale is for choosing one option over the others and that they have assurance that the studies have been correctly performed and in many cases reviewed by the Independent Review Group [IRG]. As some of the studies are still ongoing, not all the information is available yet, and people clearly want to be kept informed.

The 2011 stakeholder feedback from the recent dialogue events reinforces something that has come through in all the events we've held since 2007, i.e. that Shell has been very open and accessible about providing information, which is very important.”

**Erica Sutton** from The Environment Council continues:

“In terms of the topics discussed at the workshops, it was clear that the stakeholders wanted evidence for the rationale for the transfer of the Brent Delta decommissioning approach to the three other platforms. The work on this is still ongoing and the IRG review has yet to be done, and I think people want to see all the information before they can give the thumbs-up on that.

The Alpha jacket was another of the main decommissioning areas asked about. Broadly, there was comfort with the rationale for only partially removing the jacket down to the footings, but, again, information is still coming through from the work.

<sup>1</sup> A webinar is an online presentation with video and presentation capacity

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## Feedback from the 2011 Dialogue Events Stakeholder views

Cell management is an area of ongoing interest, because there is still outstanding investigation to be done on that in terms of cell sampling.

The GBS legs left "legs-up" were also asked about, and that was a difficult area for the stakeholders. The evaluation showed a broad range of views coming back – from 'not so satisfied' to 'very satisfied'. It was a difficult thing for the stakeholders to arrive at some sort of consensual view or steer for Shell on that, and that is a real challenge for the company.

With regard to the engagement process, the stakeholder dialogue events have evolved along with the technical work that's being carried out by Shell. As the time for Decommissioning Programme submission comes closer and the work gathers pace, the stakeholders are telling us that they know so much more than they used to, and that the level of detail provided is reaching a pitch where people feel their concerns are being dealt with and that things are a lot clearer and more formulated than they were."

### Some feedback on the 2011 Stakeholder Dialogue Workshops

#### Meeting Style and Process

Good format, well controlled through Environment Council facilitation, comments well captured. Thank you!

Well run and facilitated event.

Might be a better use of time for some not to attend these events and rather submit comments after watching the presentations online.

A well-structured workshop providing all the necessary information. The setting, facilities and catering were also excellent.

#### Decommissioning Topic/Issues

The need to gain more knowledge of the contents of the cells is a major factor and you should consider holding a further meeting when it is available.

More on pipelines next time please.

#### Information Provided

Overall good, but there were still too many unknowns to allow stakeholders to make informed/reasonable "decisions".

Venue was good, pre-reading essential for focused discussion.



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## Feedback from the 2011 Dialogue Events

### Stakeholder views

#### General Remarks

Very useful event – thank-you!

Good attempt to get stakeholder engagement.

Very interesting experience!

Excellent workshop. Shell deserves a big thank you for the ongoing work. Good luck.

A very interesting and informative day. Thank you.

Venue very good. No background noise. Well done.

The full transcript of the events was produced by The Environment Council. The opportunity was given to all attendees to comment on the first draft to ensure it is a fair and accurate reflection of what was said on the day. Both events are non-attributable and so no names or organisations appear in the report. The full transcript report is now available online, at [www.shell.co.uk/brentdecomm](http://www.shell.co.uk/brentdecomm)

The feedback evaluation summary is excellent and specifically points out the different issues that our stakeholders have with different topics. As always, there is very good feedback on The Environment Council and what they do. People tell us it's the best kind of engagement session they've been to, and so we're delighted with the process. It's important that we ensure we are engaging enough, and in the right ways, so that there are no surprises for anyone when the Decommissioning Programme goes out for public consultation.

**Gillian Hay, Communications Advisor, Brent Decommissioning Project Team.**

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## Glossary of Subsea Terms

Term	Description
<b>2-part cover/manifold</b>	This is a subsea structure which comprises a steel base used to house the seabed connections which joined the pipelines from Brent A and Brent B to the vertical riser lines from the old Brent SPAR off-loading buoy; and a protection cover, which was installed over the base when the Brent SPAR was decommissioned and removed in the 1990's.
<b>Subsea Isolation Valve (SSIV)</b>	A valve installed subsea, close to platform, which will close during an emergency to prevent flow of hydrocarbons from the subsea pipeline system back to the platform. The valve is normally located within a steel structure located on the seabed, comprising a mounting base and protective cage around the valve and associated pipework.
<b>2 valve structure</b>	This is a subsea structure which supports and protects 2 valves within the FLAGS gas export pipeline, namely a 36" diameter ball valve ~ which can be used to shut the line and a 36" check valve which is designed such that it only allows flow in one direction.
<b>Pipeline End Manifold (PLEM)</b>	This is a generic term used to describe pipework and valves which is located at the end of pipelines, normally within a support steel structure, for the purposes of controlling, isolating or connecting flow from the pipeline to or from other facilities.
<b>Concrete mattresses</b>	Concrete mattresses can be deployed over subsea pipelines and other facilities to provide dropped object protection, prevention of erosion of seabed soils around structures due to localised currents and additional weight for stability. Each mattress is typically around 5m long, 2m wide and 150mm or 300mm thick and constructed in a mould from small concrete segments joined by polypropylene rope.
<b>Rock dumping</b>	Rock dumping is a process of deploying rock onto the seabed in a controlled manner to form a protective mound of rock over pipelines or other subsea facilities. The shape and size of the rock mound are selected to meet the protection, stability and over-trawlability requirements of the design. The rock is deployed using a specialised vessel, which are normally equipped with a fall-pipe which extends from the vessel hull, down to a point very close to the seabed. The fall pipe is used to control the flow of the rock and position the rock accurately where it is required on the seabed.

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## Glossary of Subsea Terms

Term	Description
Flexible flowline/ flexible jumper	Flexible flowlines are pipelines which are constructed from several layers of steel and plastics, to form a pressure-retaining flexible hose-like structure which, unlike traditional rigid steel pipelines, can be bent easily and safely to assist installation. Flexible lines are more complex and expensive than rigid pipelines, but they can be particularly useful in confined areas of seabed where there is a lot of existing seabed infrastructure, such as close to platforms. A flexible jumper is a very short section of flexible flowline, typically less than 100m long.
ROV	A Remotely Operated Vehicle (ROV) is an unmanned submarine robot which is launched and controlled from a support ship via a hydraulic and electrical power and electrical signal cable referred to as an umbilical or tether. The ROV is equipped with a locating transmitter, propeller-type thrusters to enable it to move and hold station, and several video cameras, as well as sonar equipment, to aid navigation and to view and record video footage of the work. The most common type of ROV used for general construction and decommissioning work is a work class ROV. In addition to cameras and sonar, these ROV's are equipped with a range of tooling suited to the required task. Typical tooling includes robotic arms fitted with gripping mechanisms (referred to as manipulators), hydraulic cutters for cutting wire and rope, and hydraulic torque tools which are used to turn drive bolts which open and close valves. Other tooling includes specialized survey equipment for conducting detailed inspection work, as well as purpose built tooling for one-off tasks.
Pigging	Pipeline pigging is a process used to facilitate the operation, inspection and cleaning of pipelines, including subsea lines. A pipeline pig is a device which is propelled through the pipeline, usually using seawater or fresh water supplied and pumped from the platform topsides, or from a support ship. The pig is cylindrical in shape and sized to fit comfortably through the pipe, including clearance for bends and valves. It is also normally fitted with flexible plastic discs which seal against the inside of the pipeline and ensure that the water pushes the pig along the line. In practice, several pigs are normally used in a row (a 'pig train').