Shell U.K. Limited

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Brent Remote Flare Decommissioning Programme and Revision to the Brent Spar Decommissioning Programme (Anchor Blocks)

SUBMISSION TO DTI & THE SECRETARY OF STATE, MINISTRY OF TRADE & INDUSTRY

Keywords: Decommissioning, Remote Flare, Anchor Blocks, Brent

1 Contents

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2 Introduction

This proposal documents the Decommissioning Programme for the complete removal, onshore dismantling and disposal of the redundant Brent Remote Flare structure including the base. It does not include the associated flare pipelines which are covered under the Interim Pipeline Regime (IPR) proposals submitted on 14th October 2003 (ref. letter to DTI ref. UEAI/3dl). However, for completeness and in order to ensure full understanding of the decommissioning activities, the pipelines and other near-by facilities are discussed in the appropriate sections of the Decommissioning Programme.

This document also constitutes an additional revision to the Brent SPAR Decommissioning Plan, which was originally approved on 21st December 1994, and subsequent revisions which were approved on 26th August 1998 and 3rd July 2000. All work specified in the approved Plan was duly carried out and completed in 2000. This amendment covers the complete removal, onshore dismantling and disposal of the six concrete Anchor Blocks remaining after the removal of the Brent SPAR.

It is proposed that the decommissioning of the Brent Remote Flare and Anchor Blocks will be carried out in the following phases in 2004 and 2005:

- Pre-decommissioning surveys and engineering development studies. The pre-decommissioning surveys were successfully completed in July 2003 and the engineering development work is currently in progress.
- Removal of any residual hydrocarbons from the two pipelines presently connected to the remote flare.
- Removal and recovery of structures and equipment.
- Post-removal survey.
- On-shore dismantling and disposal.

The locations of the Remote Flare and the Anchor Blocks in relation to the rest of the producing Brent Field are schematically shown in Figure 2.1.1.

The Decommissioning Programme for the Brent Remote Flare and the revision to the Decommissioning Programme for the Brent SPAR (Anchor Blocks) are submitted in accordance with the requirements of the Petroleum Act 1998 and follows the Department of Trade and Industry (DTI) guidance notes for industry on the “Decommissioning of Offshore Installations and Pipelines under the Petroleum Act 1998”. These programmes are submitted on behalf of Brent Field operator Shell U.K. Limited (Shell) and co-venturer Esso Exploration and Production U.K. Limited (E-M) who are parties to both programmes.

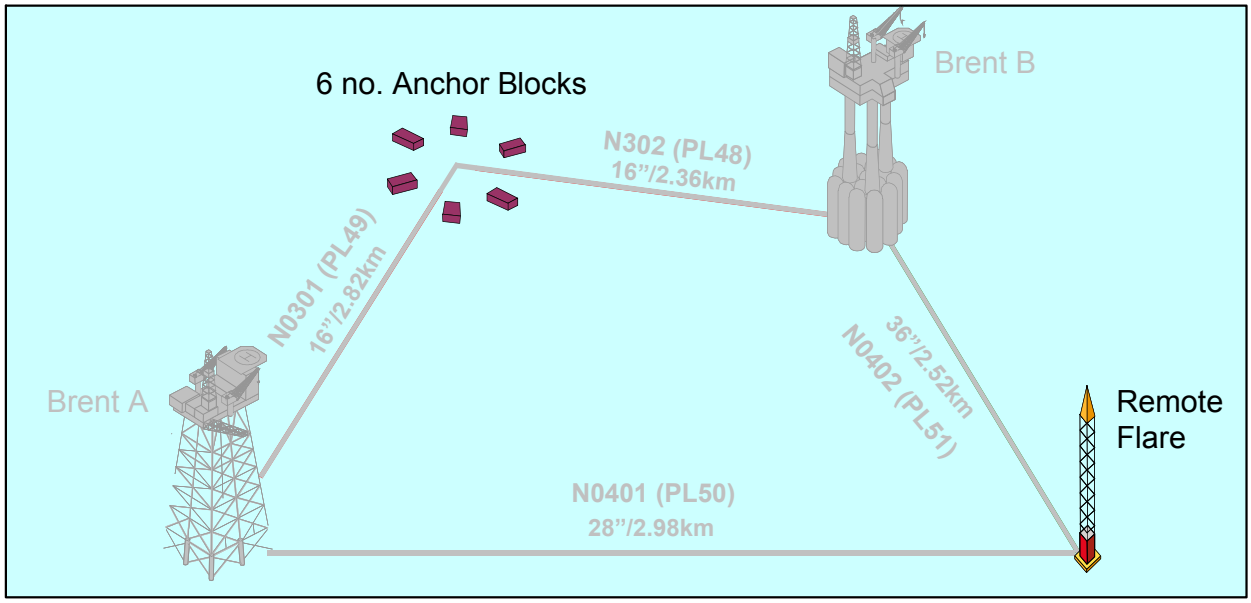


Figure 2.1.1 Location of the Brent Remote Flare and Anchor Blocks in the Brent Field.

3 Executive Summary

The Brent Field in Block 211/29 of the UK Continental Shelf (UKCS) presently contains a number of redundant facilities, see paragraph 2 below, although the Field itself will continue production for many years. This document presents an assessment of potential decommissioning options, the decommissioning programme for the Remote Flare and a revised decommissioning programme for the six Anchor Blocks at the former site of Brent SPAR.

These programmes present plans for the total removal of the Remote Flare and the six Anchor Blocks from the site and their return to shore for re-use, recycling or disposal as appropriate in 2004 and 2005. These programmes describe how Shell and its co-venturer E-M:

- reviewed a range of potential options for decommissioning the Remote Flare and the Anchor Blocks;
- examined their advantages and disadvantages in terms of safety, technical feasibility, environmental impact, effect on other users and cost; and
- selected a short-list of options that would achieve the desired outcome of total removal.

These programmes and the technical studies that support them show that it is feasible to remove the Flare Tower and the Anchor Blocks, and that there is a range of methods that could be used to achieve this end while at the same time meet the standards of safety, environmental impact and economic value that the owners have set.

The exact method of removal and disposal will be finalised and agreed with the successful contractor following detailed engineering after award of the contract by the owners. It is our desire to seek economies of scale, logistical and technical synergies by seeking innovative and flexible programme from contractors for the decommissioning of these structures. This aim is in line with the recommendations contained in the DTI Guidance Notes for the “Decommissioning of Offshore Installations and Pipelines under the Petroleum Act 1998”.

4 Items To Be Decommissioned

This section provides a detailed description of the items to be decommissioned and their layout in the Brent Field.

4.1 Remote Flare

4.1.1 Description

The remote flare structure is a 194m long articulated buoyant tower which is secured to the seabed by a gravity base. The main structure consists of a triangular truss framework with three 28" diameter legs 8.5m apart, held in place by 16" diameter flooded bracing members. Two of the 28" diameter legs doubled as gas risers and are fully buoyant. The third was intentionally flooded with seawater during the installation of the structure to maintain overall stability. When in operation, the two riser legs carried gas up the full length of the structure to the flare tips. A tidal tank and a main buoyancy tank situated at the water line maintains the vertical position of the structure by buoyancy. A concrete ballast weighing 376 tonnes is situated at the bottom of the tower. Two auxiliary floatation tanks are connected to this concrete ballast and were used for floatation during the installation of the structure. They were flooded with seawater after installation.

The bottom of the tower is connected to a weighted base by an articulated joint. The base consists of two cylindrical floats, 4.5m in diameter and 30.8m long, held 18.4m apart by a cross lattice of steel girders. The steel girders are topped with concrete ballast weighing 650 tonnes. The two floats were used for floatation during installation and were flooded with seawater after installation.

There is a small tank with a volume of approximately 180 litres above the waterline on the tower, and this supplies an oil-based lubricant to the universal joint at the base of the tower. Also accommodated on the topside are navigational aids consisting of a fog horn, lights and portable lithium batteries.

4.1.2 Structure and layout

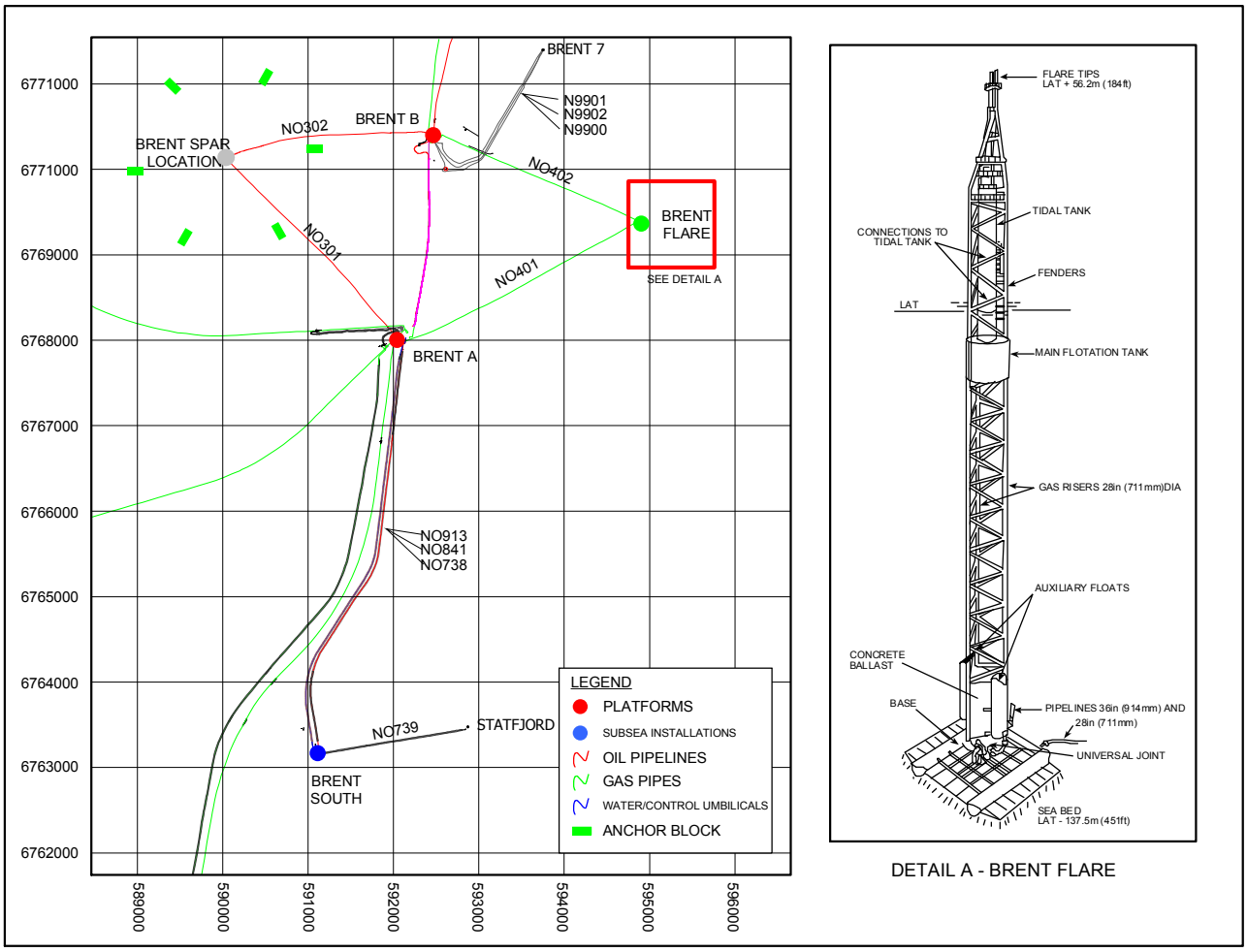
Figure 4.1.1 shows the general arrangement of the flare structure and its relative location to the rest of the Brent production facilities. The as-installed location of the remote flare is given in Table 4.1.1.

Table 4.1.1 – The as-Installed location of the Brent Remote Flare

Item	Latitude	Longitude
Brent Remote Flare	N 061^{o} 02' 46"	E 001^{o} 45' 26"

Note: Above coordinates relate to TM Projection, ED50 datum, Central Meridian 0 degrees.

Figure 4.1.1 – General arrangement of the flare structure and its relative location in the Brent Field



4.1.3 History

The Brent Remote Flare was installed in 1975 to serve the Brent Alpha and Bravo platforms. Following the modification of the Brent Bravo facilities to gather and export all its produced gas, the Remote Flare was isolated from Brent Bravo. The flare pipeline from Brent Bravo was flushed with nitrogen, isolated and disconnected at the riser on Bravo in August 1994. The flare continued to serve Brent Alpha.

In March 2003, with the completion of the Brent Alpha Redevelopment (BAR) project, the Brent Alpha platform was converted into a satellite production facility with its own local vents. The Remote Flare became totally redundant and the flare pipeline from Brent Alpha was also flushed with nitrogen and isolated on Alpha.

4.1.4 Present condition

Surveys carried out during the operational life of the flare tower have revealed a number of cracks and fatigue points in the lattice structure and the main buoyancy tank. Remedial work has been carried out throughout the life of the flare to eliminate these problems and to assure the overall integrity of the structure. Most recently, in preparation for decommissioning, several specific studies have been undertaken to assess the integrity of key elements of the structure.

The structure is currently subject to a 500m safety zone, but inspections by Remotely Operated Vehicles (ROV) have revealed the presence of some fishing-related debris on and around the structure.

Diver and ROV inspections in 2003 have revealed that the valves at the base of the flare are no longer operational and remain configured to only allow flow from both the Brent A and Brent B pipelines to the flare. The condition of these valves did not affect the operation nor integrity of the flare, but must be taken into consideration during decommissioning.

Two of the three legs of the structure doubled as risers during its operating life and are self-draining due to their vertical position. Any liquids within the risers will therefore have accumulated at the low-point of this system, and this will assist in the flushing operations. The pipelines will be flushed with seawater to ensure that they and the flare structure do not contain free hydrocarbons (ref. subsection 4.3.1.2).

Consideration has been given to the possibility of the presence of Low Specific Activity (LSA) scale in the Flare and associated pipelines. A review of the occurrence of such scale in similar systems indicates that it is normally found in association with produced water. The Flare pipelines and the Flare have never been used for produced water and hence there should be no LSA scale. There has also been no indication of any presence of LSA scale in the flare systems on the two mother platforms. However, the potential for its presence has been highlighted to the contractors and a plan will be developed to detect any presence and contingency plans will be made for removal if required.

Loose items on the topside facilities will be either stripped off or securely tied down prior to removal. These items include the navigational aids (lights and fog horn), batteries, lubricating oil, cables, load winches, heat shields, doors, ladders, gratings and handrails.

The flare tower below the mean sea level is covered by varying thickness of marine growth. Evidence from recent subsea inspections indicates that the gravity base has limited marine growth and is generally free of debris.

4.2 Anchor Blocks

4.2.1 Description

The anchor blocks are six identical structures, installed as a gravity anchor system to moor the Brent SPAR floating storage tank. The blocks are arranged symmetrically at 1km radius around the original SPAR location where only the manifold remains in place. The anchor blocks are located approximately 1.9km east of the Brent Bravo platform and 2.9km north west of the Brent Alpha platform, in water approximately 140m deep.

Each of the blocks measures 20.3m long by 6.5m wide and 4.65m high, and each has a total volume of approximately 400m^3 of mainly reinforced concrete. Each block is a reinforced concrete box forming three distinct top open compartments, which were half filled with mass concrete prior to installation. Each block weighs approximately 988 tonnes in air, and 600 tonnes in water.

At the base of each block are 30 intermittent steel skirts which are arranged in 5 rows; the skirts protrude 0.3m into the seabed for anchorage. Each top corner of the blocks has the original steel lift attachments. One end of each block has a steel mooring point which was used to attach the original SPAR mooring cables. The opposite end has a tow point which was used during the installation of the blocks. The shape of the blocks can be seen in Figure 4.2.1 (overleaf).

The existing SPAR pipelines and manifold at the former SPAR location are still in use and are not included in this decommissioning proposal (ref. sub-section 4.3.2).

4.2.2 Structure and arrangement

The location and shape of the Anchor Blocks are shown in Figure 4.2.1 (overleaf) and the as-installed locations of the six Anchor Blocks are given in Table 4.2.1.

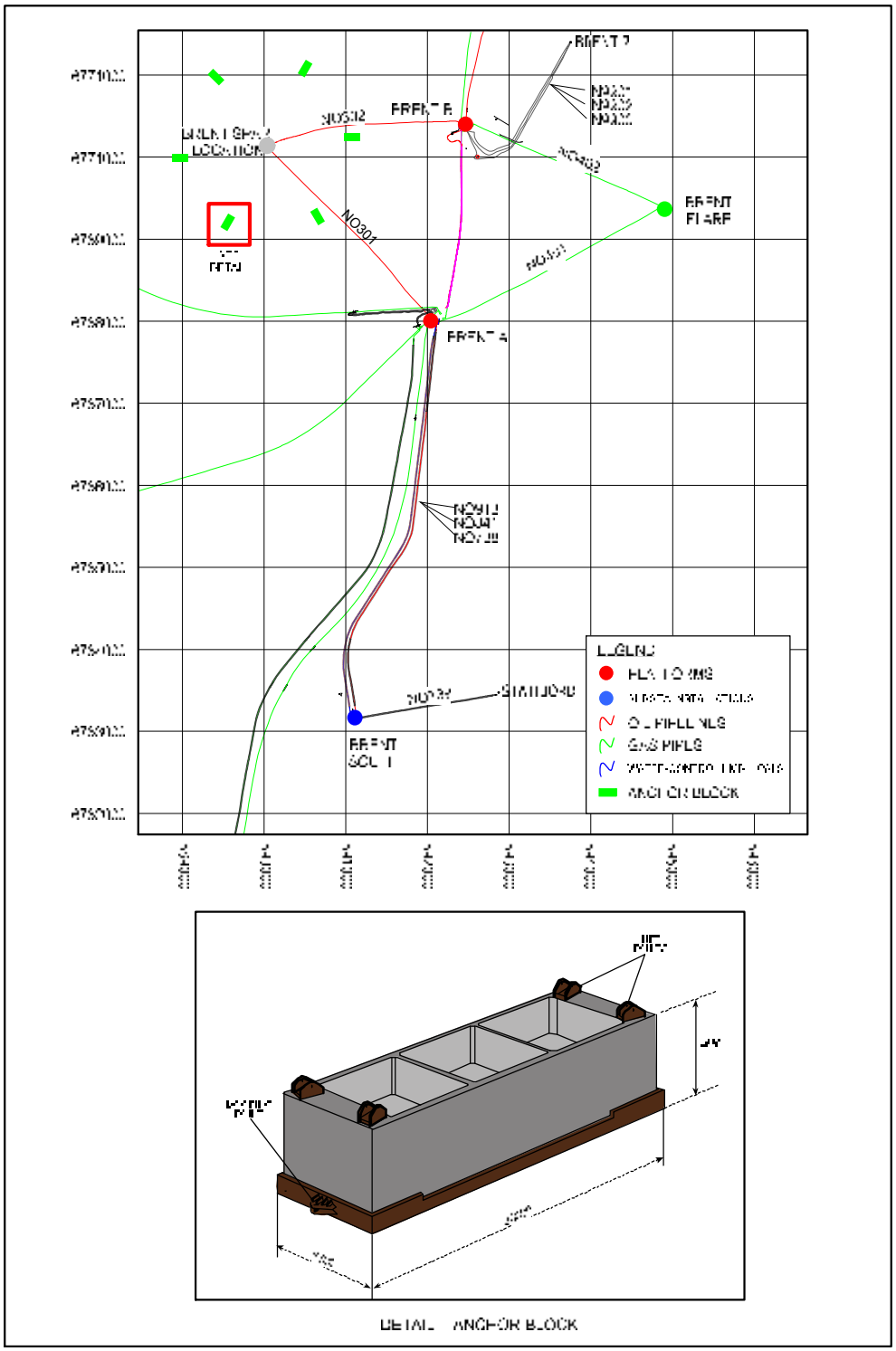
Table 4.2.1 – The as-installed locations of the anchor blocks

Item	Latitude	Longitude
Anchor Block 1	N 061° 03.29’	E 001° 41.21’
Anchor Block 2	N 061° 02.78’	E 001° 40.74’
Anchor Block 3	N 061 ° 02.75’	E 001° 39.52’

Anchor Block 4	N 061 ^{o} 03.18’	E 001^{o} 38.89’
Anchor Block 5	N 061 ^{o} 03.70’	E 001 ^{o} 39.39’
Anchor Block 6	N 061 ^{o} 03.74’	E 001 ^{o} 40.61’

Note: Above coordinates relate to TM Projection, ED50 datum, Central Meridian 0 degrees.

Figure 4.2.1 – Location and shape of the anchor blocks



4.2.3 History

The Brent SPAR Anchor Blocks were installed in 1976. When the SPAR became redundant in 1991, a Decommissioning Plan was prepared and approved by the DTI. It was decided at that time to exclude the Anchor Blocks from the Plan pending further consultations.

When the SPAR was removed from the field in 1995, all cables and mooring lines connecting the SPAR with the Anchor Blocks were recovered and returned to shore. A programme to remove snaggable items from the blocks was implemented in 1998 but a series of trawl trials in 1999 demonstrated that the blocks still had the potential to snag bottom-towed fishing gear.

Shell as operator, with the approval of its co-venturer E-M, wrote to DTI in September 2000 clarifying their intent to remove the blocks on an opportunistic basis. This strategy conforms to the recommendations in the DTI Guidance Notes (1998) that synergies of scale should be sought when considering decommissioning activities. As an interim measure, various enhanced safety awareness measures were discussed with the Scottish Fishermen's Federation (SFF) and have been put in place to minimise the hazard potential.

4.2.4 Present condition

Since construction on land and installation in 1976, the Anchor Blocks have not been in contact with any source of contaminant and remain essentially inert. Apart from a lifting point on one of the blocks which was damaged during installation, the blocks appear to be in good condition.

There is evidence of minor surface corrosion staining, minor concrete surface removal areas and light marine growth on the surface of the blocks and some debris and build-up of sand in some of the top open compartments of the blocks. These findings from the latest diver and ROV inspections performed in May-July 2003 are not expected to affect the integrity of the blocks for removal.

Following dialogues with the SFF, a programme to remove potential snagging points from the blocks was implemented in 1998. Most of the protruding snagging points, including anodes, were removed and small deflector frames were fitted on the seabed around the towing / mooring points at each end of the Anchor Blocks.

4.3 Associated pipelines and near-by facilities

4.3.1 Flare pipelines

4.3.1.1 Description

The Remote Flare is connected to two concrete-coated gas pipelines, which were laid on the seabed. Pipeline no. N0401 (PL50) connects the flare to Brent A and pipeline no. N0402 (PL51) connects it to Brent B (Figure 4.1.1). Neither line is included in this Decommissioning Programme, but the condition of the lines does have a bearing on the potential environmental impacts of the proposed operations for the flare. Both lines have been purged with nitrogen and isolated from the platforms. They remain connected to the universal joint at the base of the flare.

It is proposed that these pipelines be considered by the DTI under the Interim Pipeline Regime (IPR) until a final decommissioning plan is established for the Brent Field. A proposal has been submitted for these lines on 14th October 2003 (letter ref. UEAI/3dl). The proposal includes outline for the protection of the ends of the lines to ensure they do not present an increase in the risk of snagging. Details of this protection will be developed during detail design and in consultation with interested parties, including the Scottish Fishermen's Federation (SFF). Preliminary proposals for such protection which have been discussed with the SFF include:

- Install a cross-over line to link the two pipeline ends to eliminate end snagging hazards;
- Cap the pipeline ends and then trench and bury the ends;
- Cap the pipeline ends and then rock dump the ends to a profile with slopes not exceeding 1:3;
- Cap the pipeline ends and cover with a specially designed protection structure.

4.3.1.2 Present condition

Both lines were used to transport gas to the flare system so they are not expected to contain substantial free hydrocarbons (oil, condensate or waxes). They have been purged with nitrogen gas prior to being isolated from the production facilities at both platforms.

In order to allow the lines to be disconnected from the flare base, they will first be filled with seawater. There will be an exposure of the contents to the sea during disconnection. To minimise the risk of any release of free hydrocarbons to sea when the lines are separated from the flare, both lines may be flushed with treated seawater. To facilitate the filling and flushing exercise, temporary connections will be required at both platform ends and on the risers at the Remote Flare. Treated seawater will be pumped from a boat stationed at the Remote Flare into the risers to push the contents of the lines to the Brent A and Brent B platforms where the contents will be collected and treated.

4.3.1.3 Potential re-use opportunities for the pipelines

Whilst the Brent Field is active, there remains potential re-use opportunities for the pipeline network in the region. Potential re-use opportunities are currently being sought for the Brent flare pipelines, one of which is their application in the creation of a gas hub at Brent to export Norwegian gas to the UK. The two flare pipelines may also be linked up to provide a route for fluid transport in between the Brent A and B platforms. As long as the pipelines are associated with an active and producing field, no decision on the final decommissioning will be made.

The pipelines will remain in Shell's long-term risk-based pipeline inspection and maintenance regime to ensure their fitness for potential future re-use or the final decommissioning solution.

4.3.2 Brent Spar pipelines and subsea manifold

4.3.2.1 Description

The Brent SPAR was connected to Brent A and Brent B by two concrete-coated oil pipelines, which were laid on the seabed. Pipeline no. N0301 (PL49) connected the SPAR subsea manifold to Brent A and pipeline no. N0302 (PL48) connected the manifold to Brent B (ref. Figure 4.2.1). Neither line nor the manifold is included in this decommissioning programme as they are still in use as part of the Brent complex.

4.3.2.2 Present condition

Following the Brent Alpha Redevelopment (BAR) project, the SPAR pipelines and the subsea manifold have been re-configured in 2003 for long-term use to transport waste water from Brent Alpha to Brent Bravo for treatment. They may be used during the filling and flushing of the Flare lines.

4.3.3 Brent South pipelines and subsea facilities

4.3.3.1 Description

The Brent South is a subsea development located about 5km south of the Brent Alpha platform. Its infrastructure includes two production subsea wells (BS-01s3 and BS-02s1), a water injection subsea well (BS-03), an exploration well (3/4a-18BS1), an Umbilical Termination Assembly (UTA) and the pipelines and umbilicals connecting them to the Brent Alpha platform. Pipeline no. N0738/N0739 (PL987A) connected the subsea wells to the Brent Alpha platform and was used to transport reservoir fluids back to the platform. Pipeline no. N0913 (PL988A) and pipeline no. N0841 (PL987A.1-7) were used for water and chemical injection into the wells respectively.

As for the flare pipelines, it is proposed that the Brent South pipelines be considered by the DTI under the Interim Pipeline Regime (IPR) until a final decommissioning plan is established for the Brent Field. The proposal was also submitted for these lines on 14th October 2003 (letter ref. UEAI/3dl). The proposal includes outline for the protection of the ends of the lines to ensure they do not present an increase in the risk of snagging. Details of this protection will be developed during detail design and in consultation with interested parties, including the Scottish Fishermen's Federation (SFF). Preliminary proposals for such protection which have been discussed with the SFF include:

- Cap the pipeline ends and then trench and bury the ends;
- Cap the pipeline ends and then rock dump the ends to a profile with slopes not exceeding 1:3;
- Cap the pipeline ends and cover with a specially designed protection structure.

4.3.3.2 Present condition

The Brent South subsea facilities are no longer required and have been disconnected from the Brent Alpha platform at the base of the risers. Production from the Brent South field is being maintained via platform based long reach wells and production from the subsea wells ceased in 2001 at 98% base sediment water (bsw) cut-off.

The Brent South subsea facilities are not subject to a decommissioning programme as they will be covered by well abandonment procedures. However, for economies of scale, the subsea facilities will be removed in a routine well abandonment procedure (ref. letter to DTI dated 29th July 2003) also in 2004/2005 in synergy with the decommissioning activities proposed in these Decommissioning Programmes for the Brent Remote Flare and the Anchor Blocks.

The intent is that the Brent South pipelines will be covered in a future Brent Decommissioning Programme including assessment of the drill cuttings. The cuttings pile will be included in the industry-wide survey planned for 2004 prior to a final decommissioning decision being made in light of that survey and consideration of the drill cuttings issue in OSPAR. Refer to section 3.5 of the Environmental Statement (Appendix A) for information on the Brent South drill cuttings.

5 Environmental conditions

5.1 Environmental assessment

This section presents information on the physical and biological environment of the Brent Field, and on other commercial activities in the Brent area.

A detailed assessment of the environmental conditions in the Brent Field is given in the Environmental Statement that was prepared in support of these Decommissioning Programmes (Appendix A). For the sake of completeness and to provide a complete information source for decision-making for decommissioning, the scope of the Environmental Statement covers the decommissioning of the Remote Flare, the Anchor Blocks as well as the associated pipelines and the nearby Brent South subsea facilities. As stated in sub-section 4.3, the pipelines are being separately considered under the Interim Pipeline Regime (IPR) and are not covered in this document. The Brent South facilities are not subject to a decommissioning programme as they will be covered by well abandonment procedures.

This section is a summary from the Environmental Statement of the important physical, biological and socio-economic characteristics of the offshore environment in the Brent Field. Table 5.1.1 summarises information on the characteristics of the area in which both the Remote Flare and the Anchor Blocks are located, and Table 5.1.2 summarises its environmental features.

Table 5.1.1 Summary of the physical, meteorological and oceanographic conditions in the Brent Field

Feature	Data
Seabed sediment	Fine sands, with small amounts of silt/clay
Water depth	140m
Nearest land	Shetland, 140-150km away
Nearest platform other than the Brent Field	Ninian, 21km away
Distance to the median line	10km
Surface currents	Wind-driven and variable
Tidal currents	0.1-0.2 m/sec, with major axis running north-south

Table 5.1.2 Summary of the environmental characteristics of the Brent Field

Feature	Data
Benthic (seabed) communities	Typical of the East Shetland Basin, dominated by polychaetes (worms) that live in soft sediment.
Fish spawning	The Brent Field lies within extensive areas used as spawning grounds by cod, haddock, saithe and Norway pout.
Fish nursery areas	The Brent Field lies within extensive areas used as nursery areas by mackerel, haddock, Norway pout and blue whiting.
Seabirds	Several species are found in the Field, and the fulmar is the most common. In the Brent Field the vulnerability of seabirds to surface oil pollution is rated as “low” to “moderate” for most of the year, but is rated as “high” in July and November.
Marine mammals	No marine mammals have been observed in Block 211/29, although a number of species have been sighted sporadically in surrounding waters. Harbour porpoise is the most common marine mammal in these waters but the greatest densities occur around the Orkney Islands and off the coast of Norway.

5.2 Fishing and other sea users

5.2.1 Commercial fisheries

The Brent Field lies in an area of moderate overall economic productivity for all fisheries. According to FRS statistics, fish landings in 2002 were dominated by mackerel, which constituted 86% of all landings. Other important species landed included haddock, saithe and cod.

Figure 5.2.1 (refer following page) illustrates the hours spent fishing (fishing effort) between 1999 and 2002 by UK vessels landing in Scotland from the Brent area (ICES Rectangle 51F1), and indicates a marked decline in fishing effort with the lowest levels occurring in 2002. Peak fishing activity generally occurs between March and May, although for 2002 fishing activity remained low for most of the year. Total annual landings by UK-registered vessels landing in Scotland from the Brent area has, however, increased from 2,127 tonnes in 1999 to 10,719 tonnes in 2002.

Four species of commercially important fish are known to spawn in the East Shetland Basin area (refer Appendix A, Environmental Statement, section 8.4.6). The spawning areas and nursery grounds are dynamic, rarely fixed in one location from year to year:

- Cod generally spawn between January and April (peak February to March);
- Haddock generally spawn between February and May (peak mid March to early April);
- Saithe generally spawn between January and April (peak January to February);
- Norway pout generally spawn between January and April (peak February to March).

The environmental risk assessment for the Remote Flare and Anchor Blocks removal identified low level impacts to the marine environment due to the release of a small amount of residual fluids and the re-suspension of a small amount of sediments immediately around the Remote Flare base and the Anchor Blocks. The overall underwater operation is estimated to take less than 30 days. The potential impacts would therefore be transient over a very localised area and would only be likely to impact a very small proportion of the spawning populations. Shell, however, recognises these low level impacts to the marine environment and, if it is necessary to undertake any decommissioning activities within the spawning period, Shell will endeavour to minimise the disturbance to the seabed.

5.2.2 Oil and Gas activity

The Brent field lies in the East Shetland basin where there are numerous oil and gas developments. Beyond the Brent Field, the structure closest to the facilities covered in this programme is the Ninian Field, 21km away.

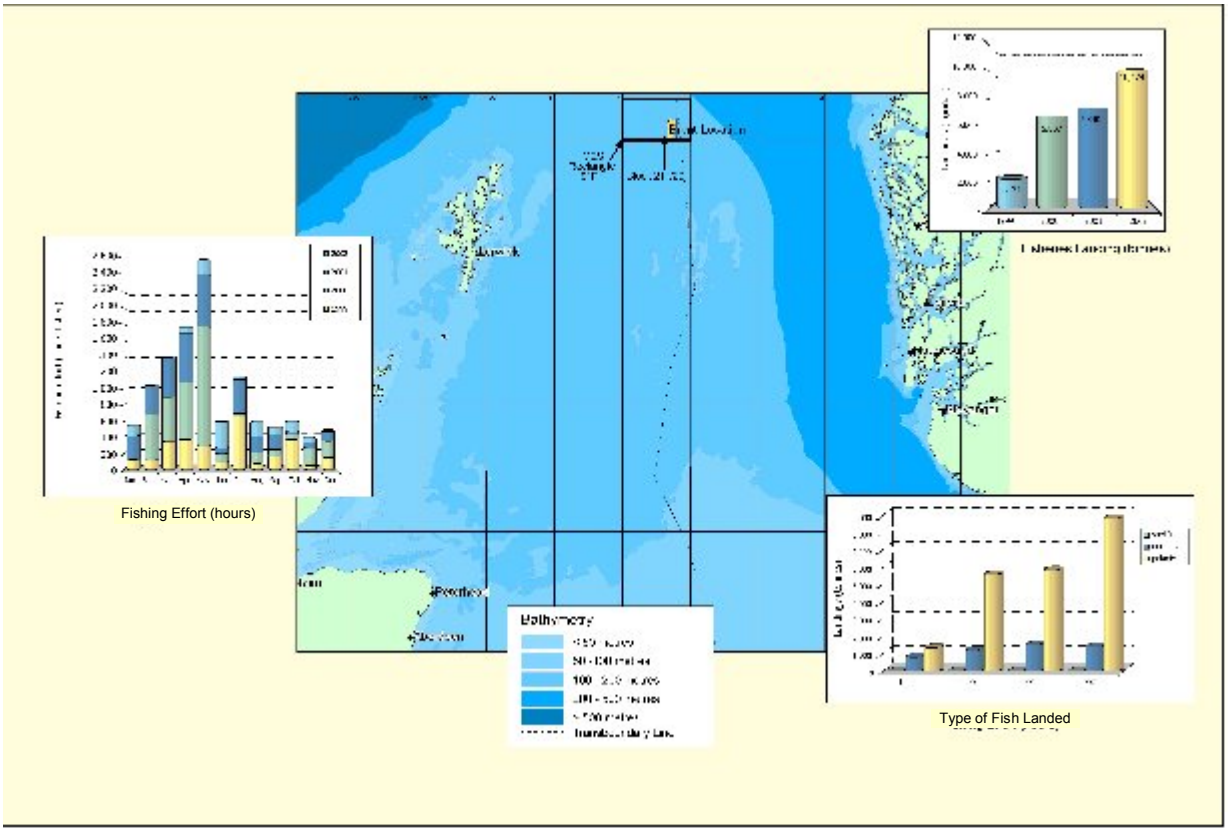
5.2.3 Shipping

The Brent Field is located in an area of moderate shipping activity, and there are 4 shipping lanes in the area surrounding Block 211/29. Vessel frequency in the vicinity of the Brent Field ranges from 0.5 to 10 vessels per day (Shell Expro, 2002); these shipping lanes are used by shuttle tankers transporting oil to onshore terminals, and supply and standby vessels serving offshore oil installations in the northern North Sea.

5.3 Conservation status

There are no habitats or species in the Brent Field that have been identified as candidate special areas of conservation (cSAC) under EC Directive 92/43/EEC (the “Habitats Directive”).

Figure 5.2.1 - Commercial fishing in the vicinity of the Brent facilities.

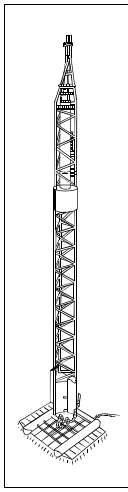


6 Inventory of materials

This section provides an inventory of the major materials on and in the facilities to be decommissioned.

Section 4.1 described the structure and dimensions of the Remote Flare, including its base. Table 6.1 presents an inventory of the materials in this structure. As described in sub-section 4.1.4, although unlikely, the potential for LSA to be present has been highlighted to the contractors and a plan will be developed to detect any presence and contingency plans will be made for removal if required.

Table 6.1 – Materials in the Remote Flare



Element	Location	Weight (tonnes)
Structural steel	Tower, tanks piping and valves	616
	Base, universal joint, bearings	310
Reinforced concrete	Ballast tank	376
	Base	650
Aluminium/Zinc	Sacrificial anodes	32
Lubrite	Bearing bushes	~1
Lithium batteries	Battery compartment	310 (no.)
Oil	Lubrication system for Universal joint	0.173

Section 4.2 described the structure and dimensions of the six identical Anchor Blocks. Table 6.2 presents an inventory of the materials in these structures.

Table 6.2 – Materials in the anchor blocks

	Element	Location	Weight (tonnes)

	Concrete	Mass infill for each compartment	410	2,460

7 Decommissioning Options

This section presents a review of the potential decommissioning options for the redundant facilities and describes the process used by Shell and its co-venturer E-M to select the preferred decommissioning option for each item.

7.1 Supporting studies and selection process

In preparation for this decommissioning programme, Shell has completed a series of studies to provide information on:

- the present condition of the structures;
- the range of options potentially available for the removal, disposal or re-use of the facilities;
- the technical feasibility of undertaking certain options;
- the safety risk to personnel of various options;
- the environmental impacts of different options; and
- the costs and logistics of each possible option.

Informed by these studies, Shell then held a series of meetings to review the potential options (the complete list of options or the “long-list”) and drew up a short-list of options for more detailed consideration. The advantages and disadvantages of the long-list options were assessed by the Shell team, using the results of the studies and their expert knowledge of offshore engineering and the particular conditions and circumstances of the facilities in the field. The short-list of options was derived primarily as a result of a consideration of the following aspects:

- the technical difficulty of performing the operations;
- the potential environmental impacts posed by the option;
- the potential safety risk to personnel posed by the option;
- the total estimated cost of the option; and

7.2 Options for the Remote Flare

A list of diverse potential options was generated, which encompassed all the possible scenarios for both the offshore operations and activities, and the ultimate treatment, disposal or fate of material in either the offshore or the onshore environment. The list of options are briefly described below. These various alternatives for decommissioning the Remote Flare were considered in an options identification and review carried out in 2002 (Shell, 2002). The results of this review are summarised in Table 7.2.1.

Leave in place: The flare tower would be cleaned and then left upright in place. A minimum programme of maintenance and repairs would be carried out to ensure that it remained secure and did not pose a risk to other users of the sea or adjacent oil and gas infrastructure. This option was rejected by Shell.

Topple *in situ*: The flare tower would be severed from its base, and toppled *in situ* by flooding the buoyancy tanks. The tower would come to rest on the seabed, where it would corrode slowly and finally disintegrate. An application for derogation would have to be made and granted for this option to be permitted. This option is not permitted under OSPAR Decision 98/3 unless derogation were granted on the grounds of exceptional circumstances. No such circumstances exist and this option was rejected by Shell.

Partial removal of top section: A crane would be used to remove the upper section of the tower. The remaining part of the tower would then be laid onto the seabed, connected to the base by the universal joint. The removed section would be returned to shore for recycling and the section left behind would corrode and eventually break up *in-situ*. This option is not permitted under OSPAR Decision 98/3 unless derogation were granted on the grounds of exceptional circumstances. No such circumstances exist and this option was rejected by Shell.

Totally remove by heavy lift crane: The tower would be removed in one of a number of different possible configurations using a heavy lift crane vessel. It would be placed on a barge and returned to shore for disposal/recycling.

Lift to shore with DSV and auxiliary buoyancy: Extra buoyancy would be fitted to the tower so that it could be lifted onto a barge using the lighter crane on a dive support vessel. The whole tower would be returned to the shore for disposal/recycling.

Table 7.2.1 – Summary of options for decommissioning the Remote Flare

Option	Technical	Environmental	Safety	Economic	Comment/viability
1. Leave in place	-ve significant continued maintenance effort required	No impact	+ve no intervention -ve third party interaction	-ve high maintenance cost -ve fishing impact liability	Not permitted under OSPAR 98/3 unless derogation granted. Option rejected by Shell
2. Topple in place	-ve some continued monitoring effort required	+ve reef effect ; maintain habitat	+ve minimal intervention -ve third party interaction	-ve some maintenance cost -ve fishing impact liability	Not permitted under OSPAR 98/3 unless derogation granted. Option rejected by Shell
3. Partial removal of top section	+ve reverse installation -ve lift integrity uncertainties	-ve local disturbance; onshore impacts; energy balance	+ve routine operations; -ve fishing interaction -ve some diving intervention required	-ve some maintenance cost -ve fishing impact liability	Not permitted under OSPAR 98/3 unless derogation granted. Option rejected by Shell
4. Lift to shore with HLV	+ve reverse installation -ve lift integrity uncertainties	-ve local disturbance; onshore impacts; energy balance	+ve routine operations; no fishing interaction -ve some diving intervention required	+ve no ongoing liability -ve high cost	
5. Lift to shore with DSV and auxiliary buoyancy	+ve reverse installation -ve lift integrity uncertainties	-ve local disturbance; onshore impacts; energy balance	+ve no fishing interaction -ve some diving intervention required	+ve no ongoing liability +ve reduced cost over lift options	
6. Piecemeal lift to shore with DSV	-ve prolong duration/exposure -ve lift integrity uncertainties	-ve local disturbance; onshore impacts; energy balance	+ve no fishing interaction -ve excessive diving intervention required	+ve no ongoing liability -ve high cost	High offshore risk exposure
7. Lift to shore with auxiliary buoyancy	-ve unproven method -ve lift integrity uncertainties	-ve local disturbance; onshore impacts; energy balance	+ve no fishing interaction -ve excessive diving intervention required	+ve no ongoing liability -ve high cost	Feasibility uncertainties

OSPAR Decision 98/3 on the disposal of disused offshore installations contains a presumption of total

or a combination of both methods was assessed. The buoyancy methods had a significantly greater subsea risk exposure in comparison with the HLV method, which became the preferred removal method because it has a proven record. Because of its design and history, the removal options for the flare are limited to those that would impose minimum additional stresses along its length. The feasible options that were carried through for more detailed analysis are described in detail in Section 8.

7.3 Options For The Anchor Blocks

A range of alternative decommissioning options for the anchor blocks was considered, and the options are summarised below. The results of the review of the long-list options are given in Table 7.3.1.

Leave in place: Leave the blocks in place, with no further remedial action and manage the potential interface with other users of the seas. The blocks would deteriorate over a long period of time; it is not known if they would become covered with natural seabed sediment. This option was rejected by Shell.

Lift to shore: Use an HLV to lift the blocks onto a barge or other vessel for transportation to shore, and subsequent recycling or disposal.

Lift to deep sea: Use an HLV to lift the blocks so that they could be transported to a deep sea site for final disposal. This option was rejected by Shell.

Lift to a prepared pit: Use an HLV to lift the blocks so that they could then be repositioned in a prepared pit, excavated on the seabed. The blocks would be carefully placed and then covered with natural seabed sediment to ensure that they did not present a snagging risk to fishermen. This option was rejected by Shell.

Rock dump: Cover the blocks with a carefully constructed layer of rock, in order to create a smooth profile that would significantly reduce, or eliminate, the risk of snagging fishing gear. This option was rejected by Shell.

Bury *in situ*: Use powerful underwater suction devices or jetting equipment to create a burial pit under or around the blocks where they presently rest. The blocks would fall into the pits which would then be filled by natural seabed sediment. This would remove the blocks from the surface of the seabed and eliminate the

Table 7.3.1 – Summary of options for decommissioning the anchor blocks

Option	Technical	Environmental	Safety	Economic	Comment/viability
1. Leave in place	No impact	+ve reef effect; maintain habitat	+ve no intervention -ve third party interaction	+ve low cost -ve fishing impact liability	Either non-interference demonstrated or derogation required. Option rejected by Shell.
2. Lift to shore with HLV	+ve reverse installation -ve suction and lift point integrity uncertainties	+ve reuse potential -ve local disturbance; onshore impacts; energy balance	+ve routine operations; no fishing interaction -ve diving intervention required	+ve no ongoing liability -ve high cost	
3. Lift to deep sea	+ve reverse installation -ve suction and lift point integrity uncertainties	-ve suitable site, longer distance than to shore -ve local disturbance	+ve routine operations; no fishing interaction -ve diving intervention required	No benefit over 2	Not permitted under OSPAR 98/3 unless derogation granted. Option rejected by Shell
4. Lift to prepared pit	+ve reverse installation -ve suction and lift point integrity uncertainties	-ve suitable site, greater disturbance	+ve routine operations; no fishing interaction -ve diving intervention required	No benefit over 2	Not permitted under OSPAR 98/3 unless derogation granted. Option rejected by Shell
5. Rock Dump	Routine operation +ve no lift risks.	+ve reef effect -ve greater local disturbance; energy balance; additional materials	+ve improve profile +ve reduced exposure over lift options Reduced interaction over leave in place	+ve reduced cost over lift options -ve continued maintenance	Reduces interactions Still likely to require derogation. Not supported by fishermen, Option rejected by Shell
6. Burial in- situ	+ve none of lift risks -ve non routine operation Doubts on feasibility in clay	-ve larger local disturbance	+ve no interactions -ve recovery of situation if unsuccessful	Medium cost	Not permitted under OSPAR 98/3 unless derogation granted. Option rejected by Shell

The OSPAR Decision 98/3 requires facilities such as the anchor blocks to be totally removed, unless there are exceptional circumstances, or non-interference with other users of the sea can be demonstrated. A study conducted in 1999 (ERT 1999) confirmed that, even after the removal of potentially snagging items or fixtures on the blocks, they still presented a snagging risk to bottom-towed fishing gear. Consequently, the various leave-in-place options were not considered further.

The removal options comprise various combinations for offshore operations and final disposal, re-use or recycling. Reverse installation by a suitable Heavy Lift Vessel (HLV) or some means of auxiliary buoyancy were assessed. Both were feasible but buoyancy had no significant benefit over the HLV method which became the preferred removal method because it has a proven record. If a coastal re-use for the blocks is found, however, the buoyancy option may offer some advantages because it allows the blocks to be relocated without having to lift them fully out of the water. The feasible options that were carried through for more detailed analysis are described in more detail in Section 8.

8 Selected Options

8.1 Introduction

The flare tower and the anchor blocks will be totally removed and returned to shore for re-use, recycling or disposal, if appropriate opportunities are available in line with the Waste Hierarchy. Having identified a short list of options, these have been narrowed down to a number of preferred options. There are several options that could achieve this outcome; all are technically feasible and realistic, and could be performed using standard offshore equipment and procedures. The final selection of the actual equipment and methods of execution from the identified preferred options will, however, depend on the detailed proposal submitted by the successful contractor. Before it is implemented, such a proposal would be reviewed in detail by Shell to ensure that the final developed option meets with the safety, technical and environmental standards outlined in this document.

This section describes the detailed options and sub-options examined by Shell. This will inform Shell's evaluation and selection of a specific methodology, as part of the process of awarding a contract for decommissioning the structures.

Shell have reviewed the potential impact of transfrontier shipment of waste and will review contractors proposals in light of the concerns this movement may rise. It is considered that there may be technical limitations that potentially restrict the destination of the structures.

Shell have considered the use of explosives during the decommissioning work and have requested all contractors to propose alternate means. In the event that explosives are required their use will be fully in compliance with the JNCC mitigation guidelines.

8.2 Remote flare

The short-listed removal options for the Remote Flare are described in the following section. Detailed assessment identified a number of ways in which each of the main options could be implemented. Each of these sub-options was therefore assessed in order to identify the potential preferred option for the removal of

It is expected that the flare and its base will be removed at the same time and as part of the same mobilisation. However, the flexible approach taken during tender of this work may result in proposals that consider a two stage programme which could delay removal of the base by up to a year after the main structure. If this is proposed for economic or technical reasons, it will be carefully evaluated and fully discussed with affected parties.

Prior to disconnecting for removal, the flare risers will first be filled with seawater and both pipelines flushed with treated seawater to minimise the risk of any release of free hydrocarbons to sea when the lines are disconnected. Temporary connections will be made at the two mother platforms and on the risers at the Remote Flare for the treated seawater to be pumped from a boat stationed at the Remote Flare into the Remote Flare risers to push the contents of the lines to the platforms where the contents will be collected and treated (ref. sub-section 4.3.1.2).

Specific localised areas of the flare structure may be required to be cleaned to permit the attachment of lifting and towing points. Debris and any obstructions such as anodes on the structure may also have to be removed. All such requirements will be identified following detailed engineering and preparatory site inspection by the removal contractor in 2004.

Following the transportation of the flare structure to the onshore demolition site, the structure will be thoroughly checked for any hazards. Any hazardous substances, if present, will be made safe and removed by specialist teams wearing appropriate protective clothing and in accordance with hazard data sheet instructions which would be prepared beforehand in line with the relevant regulations. A material tracking and environmental accounting system will be maintained throughout the project.

Shell propose to leave the pipelines which connect the Brent flare to the Brent A and Brent B platforms *in-situ*, under the interim pipeline regime. The pipelines will be maintained while possible re-use alternatives are investigated. Decommissioning of the pipelines will be included in the final decommissioning plan for the wider Brent Field (ref. sub-section 4.3.1.1).

8.2.1 Options subjected to detailed assessment

F1 Two-piece single crane vertical lift. An HLV would use a single crane to lift the tower vertically after

F2 Two piece single crane vertical lift of flare and base. This option is identical to option F1 but the base would not be detached from the flare tower before lifting. It would be retrieved onto the barge while still attached to the second, lower part of the tower universal joint. Although theoretically possible, the issues with this method is the structural integrity of the universal joint and the relative movement of the base. Additional engineering evaluation and detailed planning of the lifting sequence would be expected.

F3 Topple, 1-piece dual crane horizontal lift from seabed. In this option, the main buoyancy tank and the tidal tank would be flooded in a carefully controlled operation, so that the flare structure rotates slowly until it rests on the seabed. The two cranes on the HLV would then be used to lift the tower as a single unit, still in a horizontal orientation, and place it on a barge. This option has been divided into a number of sub-options which differ in the sequence of operations that may be undertaken to detach and extract the flare base. The base may be detached sub-sea before toppling and lifted separately, or it may be detached after toppling and lifted separately, or it may be left attached and lifted with the flare tower. The principle concerns with these options are; the structural integrity of the buoyancy and tidal tanks once flooded; the structural integrity of the tower during the lift; and the difficulties of severing the universal joint once the tower is toppled.

F4 Downend rotation to surface using auxiliary buoyancy. The base would first be separated from the flare tower sub-sea. Auxiliary buoyancy, in the form of flexible bags, would be attached to the tower and inflated in a controlled manner so that the tower is rotated into a horizontal orientation, floating on the surface of the sea. Again, there are various sub-options possible for this method. Once horizontal, the tower could be towed ("shallow draft tow") to the shore. The base would be extracted separately, brought to surface using auxiliary buoyancy and then towed to an inshore site. Alternatively, once on surface, the flare could be lifted horizontally by the two HLV cranes and placed on a transportation barge, or onto the crane barge itself. The base would be extracted and lifted separately by the HLV.

The principle issues with this option are:

- the availability of suitable buoyancy units and high pressure air to fill them;
- the structural strength of the tower when held horizontally at the sea surface and under tow or during a horizontal lift out of the water;
- the extended time during which the tower is suspended during transportation to shore; and
- the need for a HLV to lift the flare structure to shore.

- the strength of the flare tower to withstand the rotating lift;
- the design of a rigging system which allows a controlled, dual crane rotating lift with variable sling geometry; and
- the fact that there may be conflict between the mooring lines of the heavy lift vessel and the flare tower during the lift.

F6 Vertical deep draft tow. Auxiliary buoyancy would be attached to the tower before it is separated from the base. The additional buoyancy would permit the tower to be safely towed vertically to a deep water inshore site for dismantling. When under tow, the tower would have a draft of 125m and so could only be accommodated in deep Norwegian fjords. The base would be removed as part of a second campaign using a HLV. The principle issues with this option are;

- the detailed engineering that would be required to design the buoyancy and its method of attachment;
- the fact that there are risks associated with the vertical motion of the tower during a deep draft tow which must be fully assessed;
- the extended time during which the tower is suspended during transportation to shore;
- the fact that detailed design and engineering of the dismantling phase at a near shore location is required. Shell can draw upon considerable in-house experience gained during the dismantling of the Brent SPAR; and
- the potential delay prior to final removal of the base and the need to make provision for avoidance of snagging during that time.

F7 Fit auxiliary buoyancy, base detached subsea, inclined intermediate-to-shallow-draft tow to UK. This option is very similar to Option F6, but instead of a deep draft tow, the flare tower would be towed in an inclined position. This would reduce its draft and thus increase the number of onshore dismantling sites to which the tower could gain access. The flare base would also be lifted out also using auxiliary buoyancy and towed to a inshore location for dismantling. The main issues with this options are:

- the fact that the flare tower can be towed to a greater range of onshore sites;
- the ability of the flare tower to withstand forces caused by an inclined tow;

Table 8.2.1 – Feasible Removal Options – Flare Tower

Option Ref.	Option Description	Sub-Option Description	Assessment Outcome
F1	2–piece single crane vertical lift, base detached subsea	(No sub-option.)	**Option found to be technically feasible.** • Limited to use of largest available HLVs, • Option subject to detailed engineering design and temporary construction works.
F2	2–piece single crane vertical lift, cut base on SSCV deck	(No sub-option.)	**Option discounted.** • Limited to use of largest available HLVs, • Option subject to substantial detailed engineering design and temporary construction works. • Sub-sea diver-related preparatory work is technically difficult.
F3	Topple, 1-piece dual crane horizontal lift from seabed	F3.1 Base detached sub-sea before 'toppling'	**All sub-options discounted.** • Flare tower tanks will not be able to withstand pressures from being partially flooded and lowered to the seabed; auxiliary buoyancy required. • Heavy lift at depth is technically difficult. • Separating flare tower from base once it is toppled is difficult. • Flare structure will not withstand stresses imposed by a lift of the combined flare tower and base from the seabed.
		F3.2 Base detached sub-sea after 'toppling'	
		F3.3 Base remains attached and is lifted with flare structure	

F4	Downend rotation to surface using auxiliary buoyancy	F4.1 Tow at shallow draft to inshore site	**Option discounted.** • Uncertainty on the availability of suitable floatation units capable of withstanding tow period. • Flare tower will not withstand stresses caused by horizontal near-surface tow. • Extended time during which the tower is suspended during transportation to shore. • Transfer of shallow floating structure to onshore dismantling site is technically difficult.
		F4.2 Base detached subsea, Downend rotation to surface using auxiliary buoyancy, tow at shallow draft to inshore site, base extracted and auxiliary buoyancy fitted. Lifted & towed separately	**Option discounted.** • As above
		F4.3 Base detached subsea, Downend rotation to surface using auxiliary buoyancy, 1– piece dual crane horizontal lift onto transportation barge & tow inshore, base extracted and lifted separately	**Option discounted.** • Combined use of auxillary buoyancy and offshore heavy lift considered to have unacceptably high risk and cost.
		F4.4 Base detached subsea, Downend rotation to surface using auxiliary buoyancy, 1– piece dual crane horizontal lift onto crane barge & sail inshore, base extracted and lifted separately	**Option discounted.** • Reasons as above with additional cost caused by requirement for largest available heavy lift vessels to perform rotating lift of the flare tower offshore and subsequent transfer to onshore site.
F5	Downend, 1-piece dual crane rotating lift to surface	F5.1 Downend, base detached subsea, 1-piece dual crane rotating lift to surface, base extracted and crane-lifted separately	**Option found to be technically feasible.** • Method most likely to be undertaken by largest HLVs available. • Technical issues on attachment method and crane sling arrangement during lift need to be resolved. • HLV anchor line configuration will need to be arranged to avoid any interference with flare tower as it is lifted to the surface.
F6	Fit auxiliary buoyancy, base	F6.1 Fit auxiliary buoyancy, use to lift tower after base is	**Option found to be technically feasible.**

	detached subsea, vertical deep-draft tow to Norway, base extracted and auxiliary buoyancy fitted. Lifted & towed separately	detached subsea. Vertical deep-draft tow to Norway, base extracted and auxiliary buoyancy fitted. Lifted & towed separately	• Detailed engineering required to develop option. • Flare tower can withstand forces caused by a vertical tow. • Extended time during which the tower is suspended during transportation to shore. • Deep tow configuration will limit onshore site to Norwegian Fjord locations • Dismantling will be undertaken in water at deep mooring locations
F7	Fit auxiliary buoyancy, base detached subsea, inclined intermediate-to-shallow-draft tow to UK, base extracted and auxiliary buoyancy fitted. Lifted & towed separately	(No sub-option.)	**Option discounted.** • Flare structure will not withstand the stress caused by inclined tow. • Extended time during which the tower is suspended during transportation to shore.

Figure 8.2.1 – Option F1.1 Two-piece single crane vertical lift

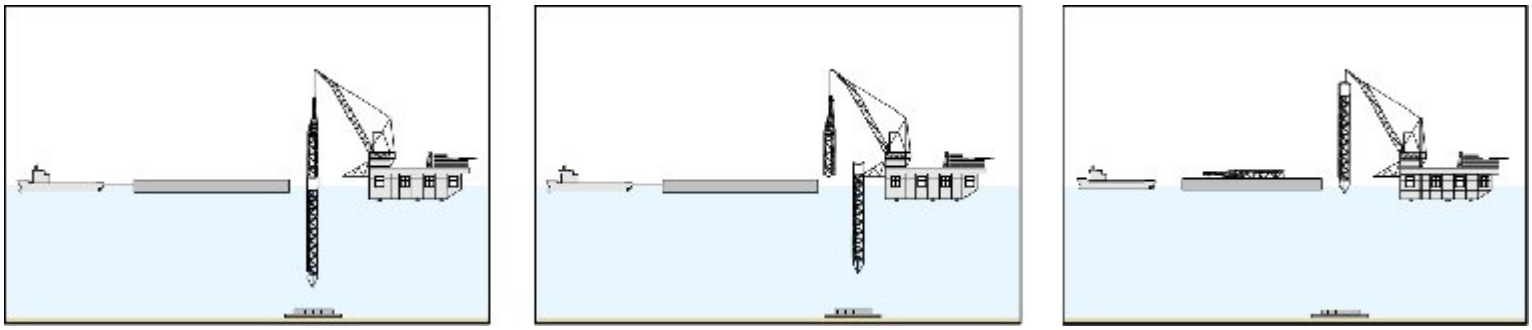


Figure 8.2.2 – Option F5.1 Downend base detached subsea with a one piece dual crane lift

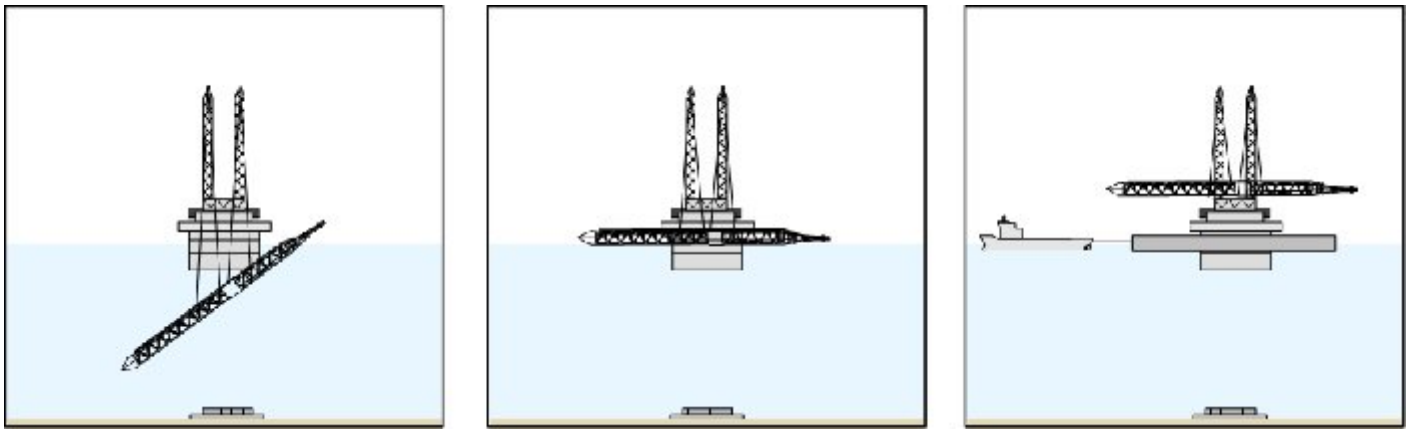
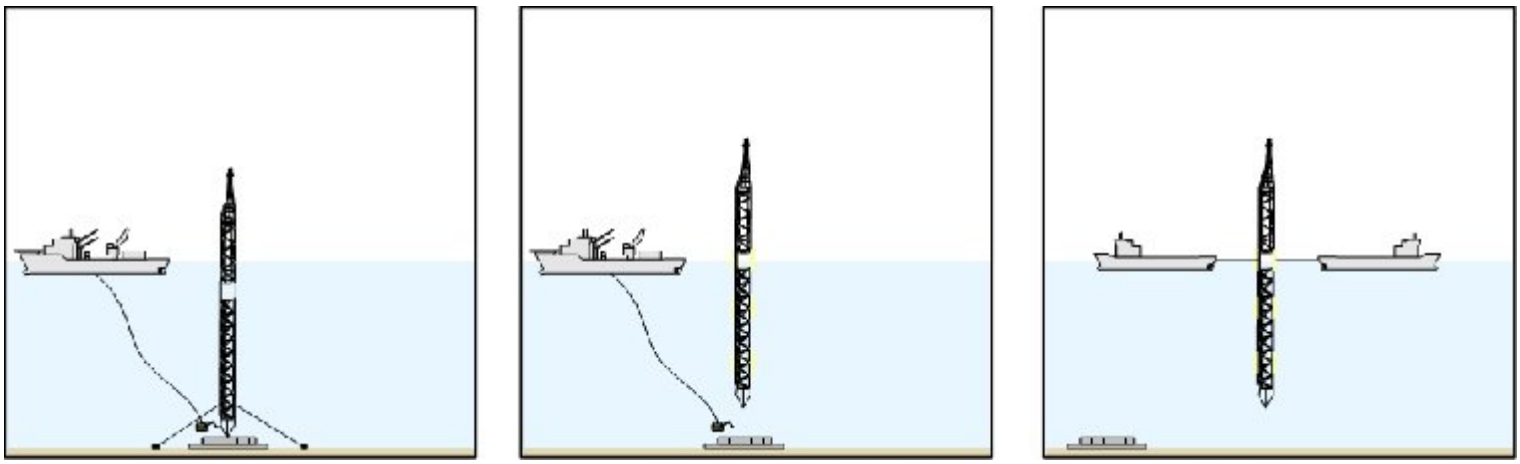


Figure 8.2.3 - Option F6.1 Vertical deep draft tow with dismantling in a deep water mooring at a near shore site



8.2.2 Preferred options for removal of the remote flare

As a result of the technical and safety reviews and the environmental assessment, Shell has selected the following as preferred options for the decommissioning of the Remote Flare structure. The options are summarised in Figures 8.2.1 – 8.2.3.

- **F1.1 Two-piece single crane vertical lift**
- **F5.1 Downend base detached subsea with a one piece dual crane lift**
- **F6.1 Vertical deep draft tow with dismantling in a deep water mooring at a near shore site**

8.3 Anchor Blocks

The short-listed removal options for the anchor blocks are described in Table 8.3.1, which also gives a summary of the results of the technical assessment. The detailed engineering assessment of the short-listed options for the anchor blocks was undertaken by Shell engineers. There are potential reception sites for the blocks in Scotland, NE England, Norway and Holland. Further details on re-use opportunities and how these are being pursued are included at the end of this section.

The anchor blocks are relatively clean as they have not come into contact with any hydrocarbon or production fluid either during their construction or service life (ref. sub-section 9.2.6). Underwater inspections indicated that marine growth cover was light, comprising calcareous deposits and soft marine growth (Hydroids).

This proposed scheme does not include the decommissioning of the SPAR to Brent A and the SPAR to Brent B pipelines as well as the subsea manifold which are still in use (ref. sub-section 4.3.2).

8.3.1 Options subjected to detailed assessment

either be transported to shore on the rig or would be transferred to a transport barge. The main issues with this option are:

- the need to identify a drilling rig with enough lifting capacity to lift the anchor block in air;
- developing a method for attaching a block to the drill string; and
- transferring the anchor block to shore.

B3 Recover from seabed using multiple rigging sets. This option is very similar to B1 above. An HLV would be used to lift the blocks from the seabed. In order to avoid lowering the lifting hook to the seabed, multiple rigging sets and a temporary structure from which to hang the block during rigging changes would be required. A variation of this option would be to use a combination of an auxiliary crane and temporary buoyancy to bring the anchors to the surface. Once at the surface the load would then be transferred onto the primary crane of the HLV to lift the block out of the water and onto a cargo barge. The issues associated with this option are:

- a greater number of HLVs can be used for this type of lift;
- rigging will be complicated; and
- there are concerns over the control of the buoyancy during the lift.

B4 Recover to the surface using auxiliary buoyancy only. This is an extension of Option B3, in which the block would be brought to the surface using buoyancy only and is then towed inshore. Variations of this option include an offshore lift of the blocks on to a transportation barge or transfer of the blocks onto a semi-submersible barge. The main issues with this option are:

- the control of auxiliary buoyancy;
- the extended time during which the blocks are suspended during their transportation to shore;
- the transfer of blocks onto the shore after the tow; and
- the additional expense of an HLV to lift the blocks onto a transportation barge.

Table 8.3.1 – Feasible Removal Options – Anchor Blocks

Option Ref.	Option Description	Sub-Option Description	Assessment outcome
B1	Single lift from seabed to cargo barge	B1.1 Lift using existing padeyes	**Option found to be technically feasible.** • Restricted to use of largest available HLVs only, and subject to confirmation that padeyes will be able to withstand force created by lifting the block in air.
		B1.2 Lift on to frame subsea, then recover frame to cargo barge	**Option found to be technically feasible.** • Option used as backup for option B1.1 should detailed engineering show that existing padeyes are not suitable for lifting
B2	Recover using semi-sub drill string	B2.1 Recover to surface, transit inshore	**Option discounted.** • Transfer of blocks from drill string to inshore site costly and technically difficult.
		B2.2 Recover above surface, transfer to cargo barge	**Option discounted.** • Transfer of anchor blocks from drill string to cargo barge not possible.
B3	Multiple lift from seabed to cargo barge	B3.1 Use multiple rigging sets and hang-off structure	**Option discounted.** • This option is technically more complicated than sub-option B3.3 but does not offer added advantage.
		B3.2 Use traction winch davits, then lift from surface to cargo barge	**Option discounted.** • This option is technically more complicated than sub-option B3.3 but does not offer added advantage.
		B3.3 Use whip hoist and buoyancy, then lift from surface to cargo barge	**Option found to be technically feasible.** • Allows the use of medium capacity HLVs.

B4	Recover to surface using buoyancy	B4.1 Surface lift to cargo barge	**Option discounted.** • Despite use of buoyancy to bring blocks to the surface, an HLV would still be required to lift anchor block out of the water and onto a barge. No clear advantage to using buoyancy lift.
		B4.2 Tow inshore	**Option discounted.** • Excessive transit time for 6 blocks taken to shore, increased vulnerability to weather.
		B4.3 Load onto submersible barge	**Option discounted.** • Large uncertainty about lifting and landing blocks onto submersible barge.

Figure 8.3.1 – Option B1.1 Single lift from seabed to cargo barge

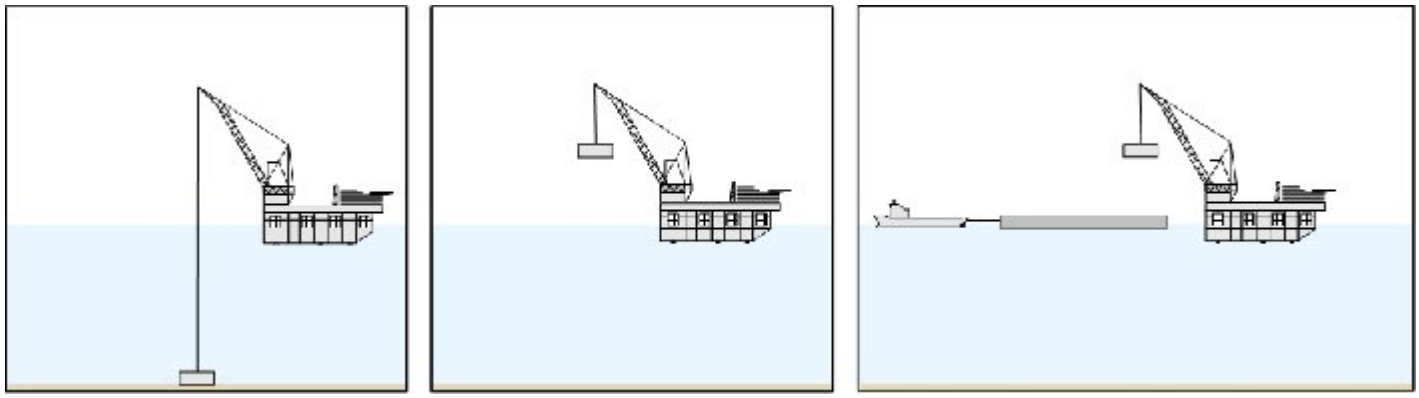
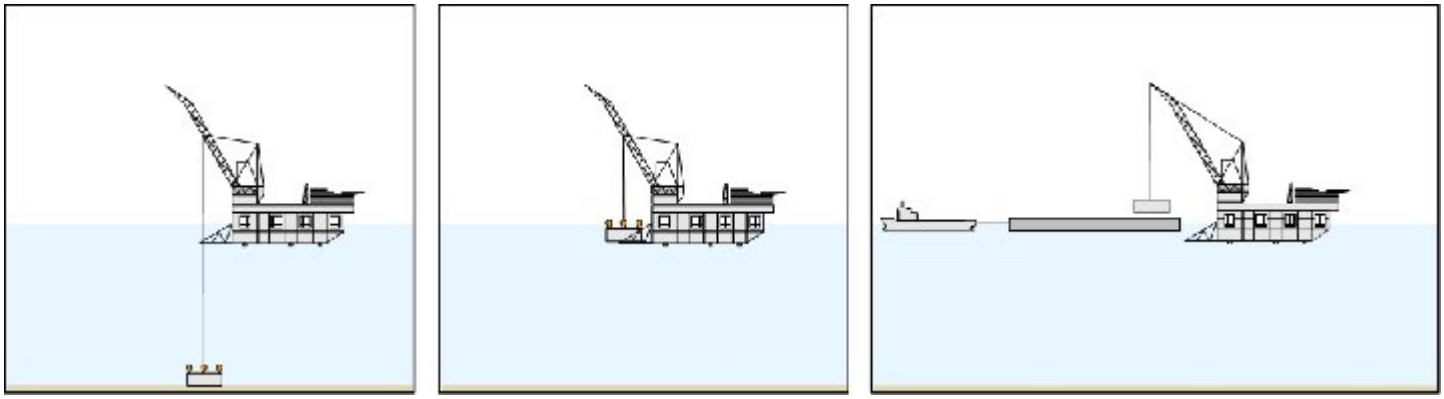


Figure 8.3.2 – Option B3.3 Buoyancy-assisted lift onto a cargo barge



8.3.2 Preferred options for the removal of the Anchor blocks

As a result of technical and safety reviews, and the environmental assessment, Shell has selected the following options as preferred options for the decommissioning of the anchor blocks. The options are summarised in Figures 8.3.1 and 8.3.2.

- **B1.1 Single lift from seabed onto a cargo barge**

- **B3.3 Buoyancy-assisted lift onto a cargo barge**

If necessary, Option B1.2 – single lift from seabed onto a cargo barge but utilising a recovery frame instead of relying completely on the existing lifting padeyes – is a back-up option for Option B1.1.

8.3.3 Potential re-use opportunities

The potential for re-use of the blocks is restricted by their weight in air of some 1,000 tonnes (dry) each. It will be difficult to manipulate them, and could be very restrictive to off-load them directly from a transport barge using barge-mounted cranes or sheer-leg cranes in shallow water. Because the blocks are only 4.5m tall, they are unlikely to be high enough to make effective quay-sides or sea defences on their own. Additional work would be required and this might make such re-use options uneconomic. Similarly, the use of the blocks onshore would be hampered by the difficulty of transporting/handling them far from the landing area. Should an opportunity arise and an economic or societal benefit be forthcoming, however, any such case will be given serious consideration. Several possible re-use options have already been identified, and these include:

- Coastal or estuarine civil construction projects requiring a temporary jetty to allow access for heavy equipment on or off transport barges. This could include projects such as the decommissioning of nuclear power stations at coastal locations where heavy loads may need to be loaded out and there are no existing quays available.

- Repair or reinstatement of small harbours or breakwaters where economic use has ceased and maintenance cost without subsidy cannot be met.

- Deadman anchors for deepwater moorings.

These options are being investigated by contacting a number of organisations such as civil engineering contractors, port & harbour authorities, local government departments, and marina developers. A "marketing brochure" soliciting prospective re-use was issued to these organisations in early December, 2003 (ref. Appendix B).

It is important that re-use opportunities are found which fit in with the planned schedule for the anchor block removal. It is also important to ensure that the potential users incorporate the anchor blocks into their proposed schemes within a limited time from delivery and that all planning permission and funding work are complete prior to handover. An assessment of the re-use opportunities will be performed upon the receipt of genuine offers to ensure these conditions are met before an agreement will be made.

If no suitable re-use application can be found in time for the agreement to be made, the blocks will be broken up for recycling as hardcore and any recoverable steel reinforcement will be recycled.

8.4 Safety

Safety has been an integral part of the assessment process for the various options. During the development and assessment of preferred options, a full hazard identification (HAZID) exercise was conducted by Shell engineers in consultation with other consultants and key contractor personnel identified to contribute to this process. The HAZID was conducted in accordance with Shell HAZID Procedure document EP-95-0312, and was conducted over two sessions which focussed on:

- the design, offshore operations and transport to shore phases; and
- the transportation near-shore, load-in, dismantling and disposal phases.

Detailed assessments of each option were made and documented, and a number of recommendations were itemised for each removal option. The most important of the recommendations relate to the management of the operation and the need to implement a range of controls to mitigate the identified hazards. The HAZID process identified that the following issues were important in the detailed development and execution of the options:

- The need for a clear definition of the requirements for the operation (such as weather window, cutting operations, inventory removal, and clean-up).
- The need for the co-ordination of the tasks to ensure that hazards are mitigated when other tasks are performed.
- The need for adequate training of crew prior to decommissioning operations, including familiarisation with the installation.
- The need for adequate management controls to be in place throughout the removal, decommissioning, dismantling and disposal operations.
- The need for liaison and communication between parties to ensure all are familiar with the tasks to be performed and the associated hazards.

9 Environmental Impact Assessment

9.1 Introduction and method

The environmental risks associated with each of the preferred options for decommissioning the remote flare and anchor blocks were assessed using a methodology based on the principles outlined in the Shell Corporate Guidance for Risk Assessment (Shell, 2000). This section provides a summary of this assessment method and of its findings. The full assessment is presented in a separate report (Appendix A).

In summary, the environmental assessment method comprised the following steps:

- Each of the proposed decommissioning options was analysed in order to identify the potential causes of environmental risks in each of the activities involved in these options.
- The potential "receiving environments", including natural and social aspects, were assessed in order to identify and characterise any sensitive elements.
- The identified risks and the relevant environmental sensitivities were brought together in order to describe and quantify the potential effects or consequences of each decommissioning option. The assessment was based on experience and the knowledge of outcomes of similar events, published information or expert judgement. Any control or mitigation measures which may be in effect when the activity is to be carried out were also taken into account.
- An overall risk rating was assigned to each aspect of the decommissioning option under consideration using a two-dimensional Risk Assessment Matrix based on the principle that risk is a product of two factors: probability and consequence.

9.2 Results of the environmental assessment

The environmental impact assessment provided a rigorous and quantitative way of:

- assessing the relative environmental "performance" of each option;

9.2.1 Results

All of the options have the potential to cause environmental impact, both as a result of planned activities and as a result of possible emergency or accidental events. None of the options was assessed to have any risks in the 'high' category, i.e. risks that would be intolerable and would represent a major constraint or 'show-stopper' for the option. All of the options had a variety of risks that were rated 'medium' or 'low'.

Many of the risks identified would arise as a result of activities and operations which are commonly performed offshore in the UKCS. These activities and their consequences are well-understood, and may be subject to a range of potential mitigation measures depending on regulatory requirements and project- and site-specific circumstances. Other risks arise from accidental events and, again, there is a range of mitigation measures that is applied subject to regulatory requirements and the project-specific level of risk.

9.2.2 Environmental risks specific to Flare Option F1.1

There may be some release of hydrocarbons when the flare tower is cut away from the base. This could arise from residual fluid in the riser, or universal joint, although this is unlikely. There could also be a small discharge of lube oil from the line which runs down the length of the flare connecting the universal joint and the lube oil header tank. The tank will be drained before disconnection.

9.2.3 Environmental risks specific to Flare Option F5.1

As with Flare Option 1.1, small amounts of residual fluids could be released accidentally when the tower is severed from the base.

The main risk is that the tower might break during the rotating lift, create debris on the seafloor and possibly also release some residual oil. The preliminary engineering study has, however, confirmed that if the rotating operation is carefully planned and controlled the tower should withstand the lift operation.

9.2.4 Environmental risks specific to Flare Option F6

associated with the dismantling operations in the fjord and the issue of the transfrontier shipment of waste must also be considered (ref. sub-section 8.1).

9.2.5 Conclusions for the flare tower

- None of the preferred options exhibit potential impacts that would be unacceptable.
- All of the options would have about the same level of impact on land.
- The deep tow option would have a higher number of “low” impacts on users of the sea, but these would be from a towing operation which is not an exceptional procedure and could be carefully controlled and managed.
- All of the options would have comparable numbers of “low” impacts in the sea, although the deep tow option (F6) would have slightly more than the other options.
- On the basis of this assessment, there is no strong indication that any one of the preferred options for the flare tower is significantly more advantageous in terms of environmental performance than the others.

9.2.6 Environmental risks specific to Anchor Block Option B1.1

As the blocks are inert and sit on relatively clean seabed sediment, emissions and discharges are not considered an issue. The main risks in this option are that the blocks may be dropped and damage the HLV or cargo barge, or the blocks may become irretrievable on the seabed if the lifting gear becomes tangled or the lifting frame fails.

9.2.7 Environmental risks specific to Anchor Block Option B3.3

There is more potential in this option for a block to be accidentally dropped, because the block must be transferred from an auxiliary hoist, via a frame attached to the side of the HLV, to the main hoist.

- The buoyant assisted lift option (B3.3) would have a higher number of “low” impacts on users of the sea because it is slightly more complicated, but the difference is small and activities would in any case take place within the existing 500m exclusion zone.

- Both options would have comparable numbers of “low ” impacts in the sea, although the buoyant assisted lift option would have slightly more than the vertical lift option.

- On the basis of this assessment, there is no strong indication that one of the preferred options for the anchor blocks is significantly more advantageous in terms of environmental performance than the other.

9.3 Energy

The performance of the preferred options for the Remote Flare and Anchor Blocks was also assessed in terms of their overall net use of energy. The method used and the assumptions made are described in detail in the Environmental Statement (Appendix A). In summary, the method accounts for all the use of energy during offshore and onshore operations, including the energy needed to recycle recovered material, and also makes an allowance for the replacement of otherwise recyclable material that is deliberately not recovered or brought back into the “chain of utility”. The purpose of this assessment was to:

- quantify the absolute net use of energy in each option, using a recognised method and values; and

- determine if there were significant differences in the net use of energy between options, and identify the reasons for any such difference.

9.3.1 Results

Table 9.3.1 shows the results for the flare structure. The deep tow option would have the lowest use of energy because it requires a smaller vessel spread offshore, working for a shorter period of time. A single value was generated because all the potential receiving sites are in Norway and the towing distances are very similar.

Both of the lifting options are presented as ranges of values, because there are several potential receiving sites in Norway and in the UK, and the differences in the length of transportation routes makes a difference to the total energy use. Option F5, rotating lift, would have a higher level of energy use than the other lifting option, primarily because additional fuel would be consumed by the vessels working at the site. According to the Environmental Statement, it is recognised that estimates of energy use may be accurate to +/- 20%. As a result, the difference between the upper value for option F1.1 vertical lift, and the lower value for option F5 rotating lift, may not be significant. The difference between the values for the two lifting options and the deep tow option may, however, be significant.

Table 9.3.2 shows the results for the anchor blocks. The range of values generated for both options takes account of the different disposal routes for the concrete in the blocks. It is estimated that the buoyant assisted lift would use more energy than the single lift, and this is a result of the additional fuel use by the vessel spread in this option. Within the accuracy of the method used, however, it is concluded that both options would use about the same amount of energy; there is no strong evidence to suggest that one option would result in significant energy savings in comparison with the other.

Table 9.3.2 – Total net use of energy for anchor block options

OPTION	Energy use (GJ)
B1.1 Single lift	240-246
B3.3 Buoyant assisted lift	277-279

9.4 Social impact assessment

An independent specialist consultant was commissioned to perform a broad social impact assessment of the preferred decommissioning options by a consideration of the following:

- direct links between the options and communities and other legitimate users of the sea;
- the economic and employment characteristics of the options and an assessment of the socio-economic

significant to differentiate any of the preferred decommissioning options. The broad social impact assessment is presented in a separate report (Appendix A).

9.5 Sustainability

Shell has developed a number of sustainability indicators. An assessment has been made to ensure that the predicted project activities during the decommissioning of the Remote Flare and the Anchor Blocks is in line with these principles. Each of the sustainability principles was addressed to assess whether it was relevant to the decommissioning of the Remote Flare and the Anchor Blocks. Actions were agreed to ensure that all activities fully support Shell's sustainability principles.

10 Consultations

This section summarises the consultation process which is being conducted by Shell with interested parties on the proposed activities for the decommissioning of the Brent Remote Flare and the Anchor Blocks.

10.1 Communication Plan

The communication plan adopted by Shell for this project is designed to be flexible, to meet the needs of stakeholders and run in parallel with the technical option development process. The plan includes a public website (www.shell.co.uk/expro/decommissioning) and information circulars which are issued to interested groups and parties who have agreed to participate in the process. If appropriate, dialogue sessions will be used to facilitate the dissemination of information on the project. A formal consultation process was conducted with all statutory consultees at the appropriate phase of the development in accordance with the DTI Guidance Notes for Industry.

10.2 Stakeholders Dialogue Sessions

Stakeholders were identified at the beginning of the project and 69 high priority stakeholders, including government, local authorities and non-governmental organisations (NGOs), were sent letters notifying them of the imminent decommissioning of the flare and blocks in April 2003. A copy of this letter and a list of these consultees are given in Appendix C. As a result of requests from some stakeholders for a preliminary meeting, an initial information dialogue session was held on 15 July 2003 to disseminate information on the decommissioning of the flare and blocks. The responses made by the consultees at that session can be grouped in the following categories:

- Requests for opportunities to raise issues directly and to be informed on key updates.
- Requests for regular updates.
- Requests to be kept updated through regular project meetings.

10.3 Consultation with Statutory Consultees and Public Notification

The statutory consultation was undertaken in February 2004. Letters were sent to the list of Statutory Consultees with copies of the draft Decommissioning Programmes on 6 February 2004, seeking comments. Refer to Appendix F for the list of Statutory Consultees and the sample letter used. At the same time, public notifications were published on local and national newspapers in the week commencing 9 February 2004 offering the Decommissioning Programmes and soliciting representations regarding the programmes. All parties who have registered their interest during the earlier dialogue sessions were informed of the public notice via e-mails. Refer to Appendix F for the notice and the list of publications selected.

Responses and comments were received from all Statutory Consultees at the end of the notification period on 12 March 2004. There were no objections to any of the planned decommissioning activities, with the National Federation of Fishermen's Organisation and the Scottish Fishermen's Federation expressing support for the proposals as laid out in the Decommissioning Programmes. Refer to Appendix F for the responses received. There were no representations regarding the Decommissioning Programmes arising from the public notifications.

11 Costs

Each of the preferred options was progressed to an initial work execution plan and cost-estimate phase. The flare tower and anchor blocks will be completely removed and returned to shore for re-use, recycling or disposal as appropriate. The preferred options for achieving this desired outcome could be executed in a number of ways depending on the vessels available and the detailed programme offered by the selected contractor. Although the main decommissioning contract has been awarded, the ultimate cost will be subject to a number of decisions to be made during the project development phases. The initial estimates of the costs for the preferred option for the removal of the Remote Flare and Anchor Blocks are illustrated in Table 11.1.

Where possible, the development of synergies with other ongoing work in the area are also expected to reduce the costs for decommissioning. Some cost-savings were achieved by combining the removal of the flare and the blocks, which creates a campaign scenario leading to:

- benefits of scale in contracts for the hire of vessels and the disposal of waste;
- efficient use of HLV and barge time;
- a reduction in the relative costs for mobilisation and demobilisation;
- the greatest possible use of any temporary grillage, temporary steel, slings, or lifting aids that would have to be used; and
- a low increase in the design and project management cost for decommissioning both structures in a combined campaign.

Table 11.1 – Cost Breakdown (Forecast)

Figures in £million	**Anchor Blocks**	**Flare Tower & Base**	**Project Total**
Design / Engineering	0.8	0.3	**1.1**
Preparation / Procurement	2.4	1.1	**3.5**
Pipeline Cleaning	-	1.7	**1.7**
Marine Activities	8.9	3.1	**12.0**

12 Schedule

This section provides information on the schedule and likely timings for the decommissioning of the Brent Remote Flare and the Anchor Blocks. Contractors were requested to bid for the decommissioning scope on a basis of executing the work in 2004 and 2005 with an option to extend into 2006.

12.1 Timings

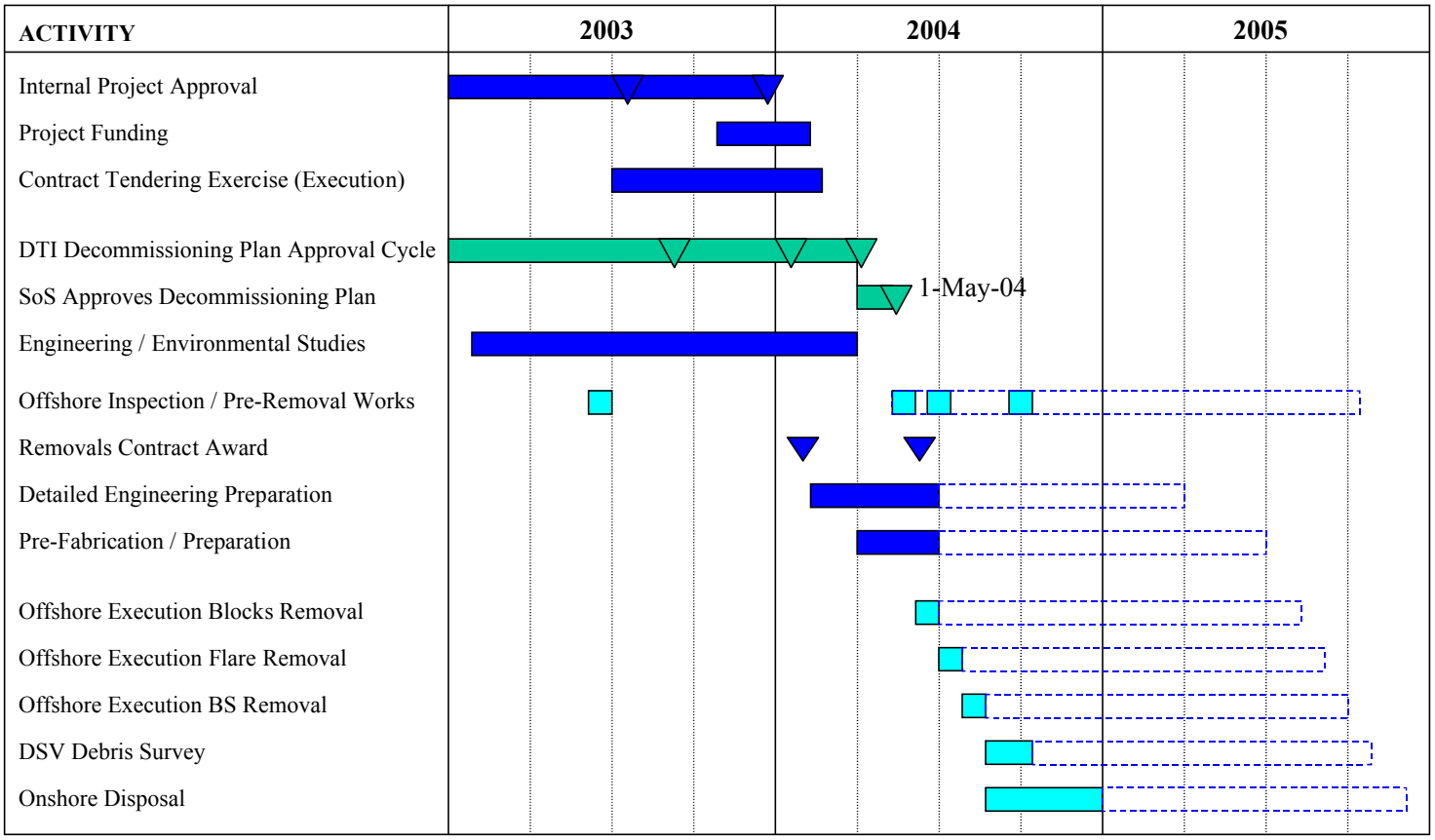
The likely timings have currently been left open and will be subject to contractual agreement with the chosen decommissioning contractors, with the condition that the work is completed by the end of 2005 as the base case. As with any offshore lifting programme, work will be limited to short periods of time when good weather can be expected. It is anticipated that all of the offshore engineering operations would be completed in the summer periods of 2004 and 2005. Such flexibility in the contractual agreements is aimed at reducing costs where possible, giving the contractor the opportunity to take advantage of any synergy opportunities with their other activities. An option to extend the work into 2006 will be allowed to take into consideration the possibility that 2005 may be a tight year for heavy lift vessel (HLV) resources due to anticipated development work in the North Sea.

Figure 12.1.1 gives an indication of the planned early-start base case timing for the removal of the Brent Remote Flare and the Anchor Blocks.

12.2 Project synergy

As indicated in Section 11, it is anticipated that the two aspects of the decommissioning work (removal of the Remote Flare tower and base, and the removal of the Anchor Blocks) will be combined in some way to maximise vessel use and where possible reduce costs. This may result in the work being spread over two offshore campaigns with the flare tower being removed during an initial offshore campaign, followed by removal of the flare base and anchor blocks at a later time. Further consideration on the safety aspects of such a phased operation are discussed in Section 14.

Figure 12.1.1 – Predicted project timings



13 Licences

The proposed programme will comply fully with all applicable UK legislation covering activities offshore and onshore. The programme is principally governed by the Petroleum Act 1998, and the DTI Guidance Notes provide a list of other relevant legislation. The project team has developed a register of the legislation applicable to the project, as illustrated in Table 13.1.

Table 13.1 Summary of applicable legislation

Aspect	Applicable Legislation		Regulator		Requirement
	English	**Scottish**	**English**	**Scottish**	
Coastal concerns	Coast Protection Act 1949 section 34, (as extended by the Continental Shelf Act 1964 section 4(1))		DfT		Provides that where obstruction or danger to navigation is caused or is likely to result, the prior written consent of the Secretary of State for the Department for Transport (DfT) is required for the siting of the offshore installation.
	Dangerous Substances in Harbour Areas Regulations 1987		HSE		Controls the carriage, loading, unloading and storage of all classes of dangerous substances in harbours and harbour areas.
Decommissioning	Petroleum Act 1998		DTI		This Act consolidates Parts I and II of the Petroleum Act 1987 with other petroleum enactments including the Petroleum (Production) Act 1934, the Petroleum and Submarine Pipe-lines Act 1975 and the Oil and Gas Enterprise Act 1982. It provides a framework for the decommissioning process.
Health and Safety	Health and Safety at Work Act 1974, and all the applicable legislation that lies beneath this over-riding Act.		HSE and Environmental Health department of Local Authority		The law imposes a responsibility on the employer to ensure safety at work for all their employees. As well as this legal responsibility, the employer also has an implied responsibility to take reasonable steps as far as they are able to ensure that the health and safety of their employees is not put at risk.
	Control of Substances Hazardous to Health (COSHH) 2002		HSE		Using chemicals or other hazardous substances at work can put people's health at risk. The law requires employers to control exposure to hazardous substances to prevent ill health.

Aspect	Applicable Legislation		Regulator		Requirement
	English	**Scottish**	**English**	**Scottish**	
Health and Safety	The Offshore Installations (Safety Case) Regulations 1992		HSE		The Safety Case demonstrates that risks of major accidents are identified and that measures are, or will be, taken to reduce risks to persons affected to as low as reasonably practicable. The existing Brent Field Safety Case will be updated. Neither the Remote Flare nor Anchor Blocks is considered an installation under The Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995 (MAR), hence no Abandonment Safety Case is required for their removal under The Offshore Installations (Safety Case) Regulations 1992 (SCR). If a heavy lift vessel is to be used in the removal, then notification of construction activity to HSE will be required.
Pollution Prevention	Environment Act 1995		EA	SEPA	The provision of this Act is to encourage producers to promote the waste hierarchy.
	Environment Protection Act 1990		EA	SEPA	Part I of the EPA identifies PPC as an integrated approach to pollution control. Part II sets out waste management and disposal requirements that affect all companies producing controlled waste, particularly section 34 that introduces the Duty of Care.
	Food and Environment Protection Act 1985		DEFRA	DTI	The dumping of wastes at sea is prohibited, except under licences issued under Part II of the Food and Environment Protection Act 1985 (FEPA II). The categories of licensed waste have included sewage sludge, solid industrial waste and dredged materials. Under the OSPAR Convention, only dredged material, fish processing waste, inert materials of natural origin and vessels or aircraft may now be disposed of at sea in the UK under FEPA II.

Aspect	Applicable Legislation		Regulator		Requirement
	English	**Scottish**	**English**	**Scottish**	
Pollution Prevention	Offshore Chemical Regulations 2002		DTI		These regulations apply the provisions of the OSPAR decision to formulate a Harmonised Mandatory Control System for the use and discharge of chemicals used in the offshore oil and gas industry. Permits are required for both the use and discharge of chemicals.
	Prevention of Oil Pollution Act 1971		DTI		Covers oil discharges. Prohibits any discharge of oil into the sea from oil and gas operations unless an exemption has been specifically issued. An exemption is therefore required for all exploration and production discharges that contain residues or traces of mineral oil. Controlled discharges include produced water, oil-based mud drill cuttings, sands and sludges. Specific requirements regarding oil content, sampling, analysis and reporting requirements are included with each exemption.
	Pollution Prevention and Control Act 1999, under which come the PPC (England and Wales) Regulations 2000, and the PPC (Scotland) Regulations 2000, as amended		EA	SEPA	Require operators of installations carrying out specified activities to submit an application for a permit. The Regulations implement the European Community (EC) Directive 96/61/EC on Integrated Pollution Prevention and Control ("the IPPC Directive"), while also building on pre-existing national arrangements for pollution control introduced under the Environmental Protection Act 1990 (EPA 90). The Act employs an integrated approach to regulating certain industrial activities and installations that may cause pollution or have other environmental effects.

Aspect	Applicable Legislation		Regulator		Requirement
	English	**Scottish**	**English**	**Scottish**	
Waste Management	Environment Protection (Duty of Care) Regulations 1991		EA	SEPA	Covers consignment of waste. The Duty of Care is a legal obligation which applies to anyone who imports, produces, carries, keeps, treats or disposes of waste. The subcontractors responsible for dismantling and disposal of the Remote Flare or the Anchor Blocks on-shore will be responsible for ensuring that the chain of Duty of Care documentation is initiated. Either Shell or the contractor will be designated as the producer of the waste (depending on the details of the disposal contract) and all parties in the chain of waste will be required to ensure that all other parties act within the law.
	Hazardous Waste Directive (91/689/EEC)		EA	SEPA	Covers all Hazardous Waste. Catalogues waste from all sources of waste generation, identifying their hazardous status. The most significant aspects of the Remote Flare and the Anchor Blocks will be batteries, potential LSA, lubricating oil and hydrocarbon residues.
	Landfill Directive (1999/31/EEC)		EA	SEPA	Introduced to reduce the amount of biodegradable material being sent to landfill. It imposes a ban on co-disposal of hazardous, non-hazardous and inert waste in the same landfill; in addition certain types of wastes are banned including liquid wastes. All waste must undergo pre-treatment prior to disposal in order to reduce potential harm to the environment.

Aspect	Applicable Legislation		Regulator		Requirement
	English	**Scottish**	**English**	**Scottish**	
Waste Management	Landfill Tax Regulations 1996				A tax on the disposal of waste to licensed landfill (unless exempt). Landfill tax is applied to the license holder for the landfill site, who then applies the rate of tax to those depositing waste as part of landfill charges.
	Merchant Shipping and Maritime Security Act 1997		DfT and MCA		Covers waste storage and handling on the dock / quayside. This act requires waste to be landed at dedicated reception terminals.
	Prevention of Oil Pollution (Reception Facilities) Order 1984, replaced by the Merchant Shipping (Port Waste Reception Facilities) Regulation 1997		EA	SEPA	Covers waste storage and handling on the dock / quayside. Oil loading terminals, repair and other ports must have shore facilities for reception of landed oily wastes.
			MCA		
	Radioactive Substances Act 1993, as amended		EA	SEPA	Covers all radioactive waste. Requires authorisation for the use of radioactive substances, but the act additionally deals with the accumulation and disposal of radioactive waste. Authorisation is required before such waste can be caused or permitted to be disposed of.
	Special Waste Regulations 1996, as amended		EA	SEPA	Covers all hazardous waste. Define special waste in accordance with the EU Hazardous Waste List. The regulations provide for a consignment note system which allows the Environment Agency / Scottish Environment Protection Agency to monitor the movement and location of such wastes.
Aspect	**Applicable Legislation**		**Regulator**		**Requirement**

	English	**Scottish**	**English**	**Scottish**	
Waste Management	Transfrontier Shipment of Waste Regulations 1994, as amended by the Environment Act 1995 (Consequential Amendment) Regulations 199, and the Special Waste Regulations Council Regulation 259/93/EEC of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community, as amended.		EA	SEPA	Once the Brent facilities have been moved from their current location and prepared for landing onshore in the UK for recycling and disposal, they will fall under UK waste management law and policy. If it is decided that the structures are to be disposed of to Norway, they will fall first under the transfrontier shipment of waste regulation and then, when transferred to Norway, under Norwegian policy. The international shipment of waste is governed by multilateral environmental agreements that take effect through EU and national legislation. This legislative framework provides a system of control that requires those wishing to ship hazardous wastes to use a consignment note so the countries concerned can provide prior informed consent to the movement. These systems are implemented in national states by bodies nominated as competent authorities. According to the EU Regulations, the notifier (the original producer, the holder or the person designated by the laws of the State of dispatch in the case of waste imported into or in transit within or through the Community) must apply for authorisation to the competent authorities of destination and send a copy of the application to the authorities of despatch, transit or destination. The notifier must make a contract with the consignee for the disposal of the waste. The contract must oblige: the notifier to take the waste back if the shipment has not been completed or if it has been effected in violation of this Regulation; the consignee to provide a certificate to the notifier that the waste has been disposed of in an environmentally sound manner.
Aspect	**Applicable Legislation**		**Regulator**		**Requirement**
	English	**Scottish**	**English**	**Scottish**	

Waste Management	Waste Management Licensing Regulations 1994		EA	SEPA	These regulations underpin the entire waste management licensing system, implementing the requirements of the EU Waste Framework Directive (75/442/EEC as amended). The regulations detail the definition of waste, disposal and recovery operations, and who requires a license.
Water Management	Water Resources Act 1991	Control of Pollution Act 1974, as amended by the Water Act 1989	Relevant individual water authority	Scottish Water	Principle regulations within the UK that control water quality, quantity, prohibiting the discharge of any poisonous, noxious, or polluting substances. A discharge consent is required, with authorisation from the relevant regulatory body.

14 Monitoring and Maintenance

This section describes the planned monitoring and maintenance activities in the Brent Field during the offshore removal operations and after their conclusion.

14.1 Post-decommissioning survey and debris removal

A post-decommissioning side scan sonar survey will be undertaken to identify any debris in the area of the Remote Flare and the Anchor Blocks out to 500m radius. All debris (any man-made object) found shall be removed and taken ashore for disposal. Evidence that the seabed is free of obstructions, detailing the survey plots and recovery logs of items, will be provided as part of the close out report to be submitted to the DTI within 4 months of the completion of the decommissioning work (ref. sub-section 15.3).

14.2 Interim Safety Management

It is possible that due to the flexible executing schedule provided to the contractors, the offshore removal operation could be undertaken over two separate campaigns. The flare tower may be removed first, followed by the flare base and anchor blocks as part of a separate and later offshore campaign. The flare base could therefore remain in situ for up to a year after removal of the tower, and Shell recognise that the base could represent an increased snagging risk. In these circumstances, appropriate interim safety measures will be put in place at the site of the flare base (ref. sub-section 8.2). Such safety measures may involve the stationing at site of a guard vessel, a marker buoy or the installation of a temporary overtrawl protection cover over the base. A final decision on which safety measures will be used will be taken in discussion with DTI.

Given the intention to leave the flare pipelines in situ under the Interim Pipeline Regime while opportunities for re-use are pursued, the ends of the pipelines at the site of the Remote Flare will be protected to minimise the snagging hazard (ref. sub-section 4.3.1).

15 Project Management

This section provides information on the planned management process for the Remote Flare and Anchor Blocks decommissioning.

15.1 Project management

A full multi-disciplinary project team is currently being assembled within Shell's project execution organisation. The team's responsibility will be to execute the decommissioning of the structures within the Company's "Opportunity and Project Management" guidelines.

Key decisions will be made and management control will be achieved by the "Gate" mechanism where full monetary authorisation will be granted.

The strategy for this project will be for the award of a lump-sum decommissioning contract to pre-qualified prime contractors. The award will be for the full life-cycle of the decommissioning operation comprising:

- Engineering design
- Preparation
- Offshore removal
- Remedy operations
- Transportation of the structures to shore
- Onshore dismantling and disposal

If appropriate, a Shell company representative will be posted to the contractor's offices at key stages of the work to ensure compliance with Shell procedures and principles.

15.2 Verification

15.3 Reporting progress to the DTI

The DTI will be given quarterly progress reports until the offshore removal operations begin, during which monthly reports will be given. The project close out report will be submitted within 4 months of the completion of work under this programme and this report will be in compliance with the DTI standard requirements.

16 Supporting Studies

Studies carried out in support of the Decommissioning Programmes are listed below.

16.1 Remote Flare

Assessment of feasible options – Shell

This report provides an initial assessment of the options for total removal of the Brent remote flare. The report identified a number of key issues which needed to be addressed in order to develop specific engineering plans for removal of the structure. The need for further underwater inspection work was identified.

16.2 Anchor Blocks

The Anchor Blocks have been under review for decommissioning option since the early 1990s. In that time the attached studies have been completed and they are presented in historical order. Whilst each study retains some element of useful data there are items that have been superseded or issues that have been subject to improved refinement by subsequent later more detailed assessment. This section aims to provide some insight into how the various study conclusions have been extracted to form the basis of the recommended decommissioning option for the blocks.

Disposal of Anchor Blocks – Global Maritime

This early report provided high level screening of potential options. It indicated that although lifting was feasible, the preferred option was leaving the blocks *in situ*. This conclusion was based on safety, environment and cost grounds. Subsequent legislation has changed the context for this conclusion but the basic activity carried out for assessing different techniques for lifting the blocks remains valid. The report discusses various lift vessel options but does not look at detailed risks involved in the lifting itself, which is covered in later reports.

Fisheries Implications – ERT

Removal by HLV – Heerema

This study complements the earlier Global Maritime screening study by presenting a heavy lift vessel (HLV) contractor's view of the removal aspects. The study demonstrates the feasibility of these options, although the costs are now superseded and omit to cover some of the identified risks relating to the lift points and suction forces.

Burial Feasibility – JPKenny

Following the Brent SPAR controversy of 1995 a further set of detailed studies was undertaken to further investigate alternative options to leave *in situ* by assessing any progress in other technologies. The first revisited burial in the light of improved cutting equipment. This indicated that burial was still not a viable option but the report also looked at other *in situ* options to make the blocks more impact friendly to trawling.

Buoyancy Lifting – Ian Murray Engineering

Supplementing the re-look at *in situ* options, this study looked at alternative lift and remove options using buoyancy techniques. The study concluded that they were feasible and provided a view on cost but when compared with HLV options, offered little advantages when considering the uncertainties. However, whilst not currently considered the base case, this technique could become more attractive depending on technology and experience at the time of block removal.

Risk Study – DNV

Taking the earlier identified main risks surrounding the removal by HLV i.e. lifting points and suction forces, DNV assessed their likely impact. Whilst there remained some doubt on lift points without some load testing to confirm their theoretical robustness, suction forces were predicted to be less of an issue than previously thought but may require a slower load transfer, and thus longer HLV time, to negate.

These aspects were reflected in the later update of the cost estimate. The report also identified that retrieval was unlikely to be achieved without significant diver intervention due to difficulties locating and

This report provides an account of the process undertaken by Shell to explore options available for decommissioning of the Brent field redundant facilities. The possible options identified to date through various preceding reports were assessed against key criteria derived from the value drivers of: safe operations, legal requirements, reputation, economics, political, environment, precedence and technical integrity.

Brent field flare structure & SPAR anchor blocks recovery – Atkins Process

This report constitutes a detailed engineering review and feasibility assessment for the main options identified by Shell for removal of the Brent Remote Flare and the Anchor Blocks. It also includes the hazard identification (HAZID) exercises addressing the offshore removal, transportation and on-shore disposal of the structures. The assessment of the options lead to identification of preferred options for the removal of each of the structures and development of preliminary work plans and cost estimates.

Environmental statement for the decommissioning of Brent redundant facilities – BMT Cordah

An independent environmental impact assessment (EIA) to examine the options for the decommissioning of Brent redundant facilities was prepared. Within the scope of this assessment were the options under consideration for the removal of the Brent Remote Flare and the Anchor Blocks. The EIA also covers the decommissioning of out of use pipelines in the Brent field and the decommissioning of the Brent South subsea facilities not covered within these Decommissioning Programmes.

17 References

Atkins Process (2003) Brent Flare & Anchor blocks recovery technical review report. Report No.: 5017793-ER-01, Issue 3.

Basford DJ, Eleftheriou A, Davies IM, Irion G and Soltwedel (1993). The ICES North Sea benthos survey: the sedimentary environment. ICES Journal of Marine Science. 50: pp 71-80.

BMT Cordah Ltd (2003) Environmental Impact Assessment for the Decommissioning of the Brent redundant facilities.

DTI (2001a). Strategic Environmental Assessment of the Mature Areas of the Offshore North Sea SEA2. Report to the Department of Trade and Industry. Consultation Document, September 2001.

DTI (2001b). Background Information on Marine Mammals Relevant To SEA2. Technical Report TR_006. Produced by Sea Mammal Research Unit, August 2001.

ERT (1997). Sediment metal and hydrocarbon contamination in the Brent field. A review of environmental seabed survey data 1977-1995. Final Report. ERT 97/252.

ERT (1999) Brent SPAR anchor block fishing interaction study.

Institute of Petroleum (IOP), (2000), Guidelines for the Calculation of Estimates of Energy Use and Emissions in the Decommissioning of Offshore Structures.

IOE (1990a). Post-drilling environmental survey of the benthic sediments at Brent A – 1990. A Report Prepared for Shell UK Exploration and Production November 1990. Reference IOE/90/984.

OSPAR Commission (2000). Quality Status Report 2000, Region II – Greater North Sea. OSPAR Commission, London.

Shell U.K. Exploration and Production (2002) Brent redundant facilities decommissioning. Feasibility-Option identification and review report. Report No.: E02009.

Shell U.K. Exploration and Production (2003) Brent redundant facilities decommissioning-Sustainable development assessment.

UKDMAP (1998). United Kingdom Digital Marine Atlas – An atlas of the seas around the British Isles. Software third edition compiled by British Oceanographic Data Centre, Birkenhead.

Appendix A

Environmental Statement in support of the Decommissioning of Brent Redundant Facilities

(Refer to separate attached document)

Brent Field Redundant Facilities Decommissioning: 'High-Level' Social Impact Assessment

(Refer to separate attached document)

Appendix B

Organisations who responded in the search for re-use opportunities for the Anchor Blocks (to date)

Name of Organisation	Address	Contact Name
Shell Preliminary Contacts		
Peterhead Bay Authority	Bath House, Bath St., Peterhead, AB42 1DX	J.G.Ewart, Acting Harbour Master
Peterhead Harbour Authority	Harbour Office, West Pier, Peterhead, AB42 1DW	John Paterson, Chief Executive
EnviroCentre	28 High Street Stonehaven Aberdeenshire AB39 2JQ	Brian Menzies
Civil Engineering Consultants		
Arch Henderson & Partners	26 Rubislaw Terr. Aberdeen AB10 1XE	J. Simpson
Babtie Company	95 Bothwell Street, Glasgow, G2 7HX	Alan Waugh and Alan Bell
Carl Bro A/S	Granskoven 8, Glostrup, Denmark, DK- 2600	Niels Lykkeberg
Peter Fraenkel Maritime	South House, 21-37 South St., Dorking, Surrey RH4 2JZ	Peter Martin MD
Grenaa Havn A/S	Nordhavnsvej 1, Grenaa, DK-8500, Denmark	Eivin Stein Laursen, Technical Manager
Civil Engineering Contractors		
Nuttall plc	St James House, Knoll Road, Camberley, Surrey GU15 3XW	Chief Executive, Peter B Brooks; Director Engineering, Eric E Hughes
Marinas		
Inverkip Marina	Kip Marina, The Yacht Harbour, Inverkip, Renfrewshire, PA16 OAS	Martin Latimer, Managing Director
Port & Harbour Authorities		
Lerwick Port Authority	Albert Building, Shetland ZE1 0LL	Capt. Archer Kemp, Harbour Master
Sullom Voe Terminal	Port Administration Building, Sella Ness, Sullom Voe, Shetland, ZE2 9QR	Jim Dixon, Harbour Master
Shetland Isles Council	Town Hall, Lerwick, Shetland, ZE1 0HB	Michael Craigie
Wick Harbour Trust	Harbour Office, Wick, Caithness KW1 5HB	Mr M. Bremner and J. Simpson
Peterhead Bay Authority	Bath House, Bath St., Peterhead, AB42 1DX	J.G.Ewart, Acting Harbour Master; John Paterson, Chief Executive
Scrabster Harbour Trust	Scrabster Harbour Trust, Scrabster, Caithness, KW14 7UJ	B.Williams and Donald Allan
Cromarty Firth Port Authority	Port Office, Shore Road, Invergordon, Ross-shire, IV18 0HD	George Dobbie
Aberdeen Harbour Board	Harbour Office, 16 Regent Quay, Aberdeen AB11	C. Parker, Harbour Master,

Brent Anchor Blocks Offer For Prospective Re-Use

(Refer to separate attached document)

Appendix C

In 2002, Shell performed a stakeholders analysis to identify all parties having an interest, involvement or who are potentially affected by the decommissioning of the Brent Remote Flare and Anchor Blocks. Over 100 stakeholders, representing over 90 organisations were identified, analysed and given a priority ranking based on the expected level of interest and the predicted potential impact. A "letter of intent" was sent to the high priority stakeholders on April 2003 to inform them of Shell's intents and to provide an opportunity for any issues to be raised early for Shell's consideration. Below is the list of stakeholders contacted by letter.

List of stakeholders contacted by letter

Aberdeen and Grampian Chamber of Commerce

Aberdeen City Council

Aberdeenshire Council

AEEU/PILOT

AFEF (Atlatntic Frontier Environmental Forum)

Amicus - AEEU

BT Worldwide (British Telecom)

CBI Scotland (Confederation of British Industry)

DEFRA (Department for Environment, Food and Rural Affairs)

Department of Trade and Industry

NERC Dunstaffnage Laboratories (Natural Environment Research Council)

English Nature

Exterminator UK

ACOPS (Advisory Committee on Protection of the

Greenpeace

Halcrow Group

Herriot-Watt University

Highland and Islands Council

Health and Safety Executive

IMCA (International Marine Contractors Association)

Industry Technology Facilitator

Joint Nature Conservation Committee

LASCOF (Local Authority Standing Committee on Oil Fabrication)

Local Members of Parliament and Members of the Scottish Parliament

LOGIC (Leading Oil and Gas Industry Competitiveness)

Marine Conservation Society

FRS Marine Laboratory Aberdeen (Fisheries Research Services)

OGP (Oil and Gas Producers)

OILC (Offshore Industry Liaison Committee)

Orkney Islands Council

Resource Environmental Solutions Group

Robert Gordon University

RSPB (Royal Society for the Protection of Birds)

SCDI (The Scottish Council for Development and Industry)

Reading University

Scottish Association for Marine Science

Scottish Enterprise Grampian

Scottish Environment Link

Scottish Executive Environment division

Scottish Executive Energy division

Scottish Executive Radioactive wastes team

Scottish Executive Sustainable development team

Scottish Fishermen's Federation

Scottish Natural Heritage

Scottish Parliament

Scottish Parliament Cross Party Oil and Gas Group

Scottish Wildlife Trust

Sea Mammal Research Unit

Scottish Environment Protection Agency

Shetland Decommissioning Company

Shetland Fishermen's Association

Shetlands Islands Council

SOTEAG (Shetland Oil Terminal Environmental Advisory Group)

Scottish Society for the Prevention of Cruelty to Animals

STUC (Scottish Trades Union Congress)

The Fishermen's Association Limited

The Industrial Society

The Natural Step

UK Oil & Gas Group

United Kingdom Offshore Operators Association

University of Aberdeen

University of East Anglia

University of St Andrews

Westminster Cross Party Oil and Gas Group

Whale and Dolphin Conservation Society

World Wildlife Fund

World Wildlife Fund Scotland

Letter sent to stakeholders and interested parties

Dear «Mr» «Surname»

Brent Field Redundant Facilities Decommissioning

I am writing to inform you that Shell Expro has started preparations for decommissioning some ancillary facilities in the Brent Field. The four main platform structures are not affected and will continue to be a significant contributor to, and infrastructure hub for oil and gas production in the UK.

Following the recent redevelopment of the Brent Field, the Brent remote flare became redundant early this year. This increases the redundant facilities in the Brent field, adding as it does to the Brent Spar anchor blocks, and the opportunity exists to decommission these facilities

Shell's commitment to Health, Safety and the Environment in the pursuit of the goal of no harm to people, protection of the environment and the efficient use of materials and energy are fundamental to our decommissioning activities. . We intend to consult widely with all who have an interest in the decommissioning of the Brent Redundant Facilities and invite you to take part in this consultation process.

If you are interested, I would be grateful if you could complete the attached form and return it to Phil Dyer at the above address, by fax to 01224 882100 or by e-mail to phil.dyer@shell.com. Please pass the form to anyone else in your organisation that might also be an appropriate contact for consultation

In the meantime, a fact-sheet on Brent Redundant Facilities is enclosed with some background on the Field. There will be a website (www.Shell.co.uk/expro/decommissioning) launched on 15th April where a full description of the project can be found. New information and progress updates on decommissioning will be posted as it becomes available.

Yours sincerely

George Lang

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Appendix D

Record of the Preliminary Stakeholders Dialogue Session dated 15th July 2003

BRENT REDUNDANT FACILITIES DECOMMISSIONING PROJECT
STAKEHOLDER MEETING - 15TH JULY 2003

WOODBANK HOUSE, NORTH DEESIDE ROAD, ABERDEEN

Objectives

- To ensure genuine involvement of stakeholders.
- To ensure understanding of Shell's values, principles and logic on the approach to the Brent Redundant Facilities decommissioning project.
- To outline the timeline and processes we will be following in developing a full decommissioning programme for submission to the DTI.
- To explain the options we have considered and the decision making process to date.
- To give the opportunity for Shell to listen to stakeholders and consider any appropriate actions arising from the dialogue.
- To agree principles for future dialogue - frequency, reporting back, etc.

ATTENDEES

Phil Dyer	External Affairs Shell Expro
William Gan	Brent RFD Project Leader- Shell Expro
Chris Blaydon	Brent Operations Improvement Leader- Shell Expro
James Parker	Sustainable Development Advisor- Shell Expro
Tim Davenport	Technical Safety Advisor- Shell Expro
Duncan Cursiter	Shell Fisheries Liaison Officer
Zoe Crutchfield	Joint Nature Conservation Committee
Michael Sutherland	Scottish Fishermen's Federation
Dave Bevan	National Federation of Fishermen's Organisation
Ray Johnstone	Environmental Protection Section, Fisheries Research Services
Jim Davis	Project Manager, Scottish Enterprise Energy Team
Mike Curtis	Scottish Environment Protection Agency
Bill Murray	Offshore Contractors Association
A.D McIntyre	AFEF- Aberdeen University
Jake Molloy	OILC
Bruce Stewart	Environmental Group - Water Environment Unit- Scottish Executive
Murdo McIver	Shetland Decommissioning Company
Bob Kelley	Facilitators UK

Apologies:

Graham Tran	AMICUS

GROUPED FEEDBACK

a) GENERAL

In general terms, feedback was mostly positive and constructive, indicating a supportive group. The group genuinely appreciated the opportunity to listen to the scope of the project, and confined the bulk of their comments to this specific.

The following is a comprehensive record of the issues and queries raised on the day. Responses and answers are provided by Shell on a separate Questions and Answers list (attached).

At the end of each topic the independent facilitator provides a summary of the issues raised and recommendation for follow up action.

b) ANCHOR BLOCKS

- What about the sediments to be disturbed?
- What is the scale and significance of any residues left behind following decommissioning?
- Disturbance of paint/marine growth and/or any local soil contamination should be avoided
- Any deliberate removal of such material(above) will need to be carefully controlled
- Has Shell considered suction dredging beneath the blocks to sink them and then rock dump them?
- If Shell propose the use of explosive at any point, that the current version of the JNCC Guidelines for explosive use should be followed. This will involve using Marine Mammal Observers and acoustic detection methods. Other companies have been caught out when they have wanted to use explosives at short notice but have not considered that these mitigation measures are necessary.

Summary:

The state of the seabed following removal is the concern here. Again, the concern is around the fishing industry.

Suggested Action:

- Find a comparative situation, and illustrate the state of the seabed following structural removal. Some convincing demonstration of fate is needed.

- What about any marine fouling of the structures?
- What about any protection of the structures? Is there any chemical concerns on coatings, sacrificial anodes, etc?

Summary:

Possibly due to throwbacks to Brent Spar situation, there seemed to be concerns on what residues could remain in the structure and associated pipe work, as well as the marine coatings used for structural protective purposes. There was a genuine attempt to assimilate the design features of the structure, and a genuine interest in the rationale behind the removal decision.

Suggested Action:

- Prepare a more detailed description of the flare tower and its structural and operational features. Stress its importance in the life of the Brent Field until now.
- Highlight the absence of residues in the ballast tanks, or the minimal nature of these, if present, in the associated riser pipe work.

d) PIPELINES

Comments:

- Do you have more information on the pipelines that are being left?
- These lines are not buried.
- What is the minimum requirement for leaving the pipelines in place?
- How are you going to make the case for re-use and leaving the pipelines in-situ? (NB there was a specific insistence on removal on environmental grounds).
- What about the fishermen's concerns - are they being addressed?
- There is a need for greater transparency for the re-use of the pipelines option. Justification is needed.
- The threats of left pipelines to the fishing industry must be considered – e.g. Westhaven incident. Concern in the industry has resulted in some overtrawling trials on pipe bundles.
- There is a need to give more clarity to the pipelines options.

Summary:

- A robust case for leaving pipelines in place for potential future re-use is to be made. The Interim Pipeline Regime forms are to be filled for all redundant lines.
- Potential re-use scenarios for the pipelines in Brent field will be identified and recorded.

e) COMMUNICATION

- Shell should be complimented on their approach to dialogue
- Appreciate and grateful for the invitation and the opportunity to attend the meeting
- There is a need to keep the general public more informed
- Have the stakeholders been engaged early enough to have an influence?
- It is difficult to imagine the scale of the problem. How big is the project?
- How much have the workforce been consulted?
- Better communication with the offshore workforce would make them feel more involved.
- Why are there not any critical/opponent stakeholder groups at the meeting?
- There is a need to advertise the project wider and manage the wider public perception.
- Shell should not be afraid of being more proactive and letting people know what the proposals are
- This is a relatively simple decommissioning project and should be presented as such
- It appears some Stakeholders are missing. On what basis was this group selected?
- Consider a media campaign and articles in the press to advertise re-use opportunities more
- Should dialogue not have taken place earlier?
- Senior Management (Decision Makers) need to be present at these meetings.

Summary:

The more significant concern within the group appeared to rest on whether stakeholders had been consulted early enough in the project process to still have an influence. Composition of the group was queried, and allowed for a convincing explanation of why certain notables were absent. Both public perception and workforce participation in the project were referred to as concerns, but not critical ones.

The team concluded that such a campaign is not necessary considering that a communication campaign (part of B-RFD Reputation Management Plan) is already in place and the relatively straightforward and limited B-RFD scope.

f) OPPORTUNITIES

- Have we fully explored the re-use opportunities?
- There is a need to pursue opportunities more rigorously.
- How much of a time-lag, in terms of material storage, is the project willing to accept in order to obtain the best option for re-use?
- Can the blocks be cut up into more useable blocks (100/200 tonnes etc)?
- Has the project looked at suction dredging underneath the blocks and burying them on site?
- Re-use opportunities could include sea defences off the coast of East Anglia e.g. Rock Reefs
- Re-use opportunities must exist and more dialogue is needed. Consider contacting Institute of Civil Engineers/DTI/Port Authorities
- There are several examples of where the blocks could be used- Scapa Flow/River Forth reclamation/Thames area- all these should be explored.
- Are these really the right materials for coast protection schemes? We need to be sure.
- New regulations rule out the use of explosives in the removal of these objects.
- Artificial reefs and marine habitats are not an option, since our Laws of the Sea do not allow such habitats to be managed currently. Also reef productivity is problematic.
- You have to consider the residual liability in any re-use opportunity.
- What about contacting and working with Shell Renewables for re-use opportunities?
- Reuse opportunities should include:- Harbour breakwaters/sea defences/bridge foundations/anchor points for vessels etc/ offshore wind farm bases.
- Consider open competition on re-use options.

explosives etc.). The reference to the participation of Shell Renewables came from stakeholders, not Shell personnel, which is significant.

Action:

- A Scope of work is being put together by Consultants; WS Atkins ,they understand the limitations and constraints regarding re-use. They are also well-placed due to their existing contacts with coastal/civil construction contractors - the potential re-use candidates. We are planning to use them to try and find the best option for the anchor blocks.Atkins will identify and interface with potential re-use Industrial Sector, Agencies and Organisations Database of areas of opportunity will be established and options identified and pursued. Marketing Information will be provided

- Shell Renewables have been contacted on aspects of reuse of the materials available for both their current projects and in a more general; sense, and develop a reuse strategy.

g) ORGANISATIONAL/ SD

- Why not use a different title that Sustainable Development?
- The problem here is “balance”. How do we develop and use the tools to get the right balance for SD?
- The Opportunities/ Project Management Process shows several check points, known as “Gates”, at which points decisions are made regarding the progress of the project. Who sits on the “Gates”, and on what basis are decisions made?
- Does SD apply to a sale of an asset such as Brent?
- Is the fate of the entire Brent Asset currently under discussion? Has the future of the Brent Field been taken into consideration in this project?
- How does Shell assess energy use in this decommissioning situation? There was a query as to the deep tow option having the lowest energy expenditure.
- Energy use was singled out for this presentation, but a range of criteria are scrutinised.
- Shell’s bureaucratic decision- making process needs to be transparent. Has it changed since 1995?
- Have decisions been taken already?
- Have Shell learnt the lessons from Brent Spar?
- Shell is still blinkered; there is a feeling that the decisions have already been taken
- Is Shell doing enough for the UK in terms of Sustainable Development? Social impact

- Is there scope for a generic (UKOOA) structure to stakeholder dialogue

- Make sure the DTI is closely involved. Some thought their attendance was warranted at this event.

Summary:

This area was the more controversial of the aspects of the feedback. There was a certain strain of "can we believe Shell?" still around, which dialogue around the table with Shell people greatly helped to alleviate. The indication of the process associated with this project was useful, but not easy for everyone to pick up. The strategic approach towards decommissioning, possibly via UKOOA was significant. The social pillar of Sustainable Development is seen as the one least addressed.

Action:

- For future stakeholder workshops, make sure the process is highlighted, with special reference to decision making and the effects of stakeholder and other outside influences.

- Approaches have been made with other operators to consider an industry strategic approach for the decommissioning consultation process.

- Social impact study is to be carried out which will cover;:impacts on livelihoods of other sea users ;Impacts on community from onshore transport, on-site processing and re-use/re-cycling activities and transport to point of eventual use (noise, dust, visual aspects); Economic impacts including number of full-time job equivalents created, types of jobs and duration, effect on unemployment rates, indirect jobs created and contribution to viability and longevity of onshore facilities used for decommissioning

h) SUMMARY FROM CHRIS BLAYDON (WHAT SHELL HAS LEARNT)

- There is a need for more clarity and transparency around the pipelines.

- There are a lot of additional options for re-use we must consider.

- There is a need to increase general public awareness with more media involvement.

- We could have considered engaging with stakeholders a little earlier in the project.

- We must give higher profile to social impact.

BRENT RFD STAKEHOLDER DIALOGUE MEETING (15 July 2003)

GENERAL QUERIES

What about the fishermen's concerns - are they being addressed?
Fishermen are represented by the Scottish Fishermen's Federation (SFF) who are Statutory Consultees on the decommissioning plan. We also have quarterly project meetings with the SFF where concerns can be raised and discussed. We have built up a trusted relationship with the SFF over the past many years and they have complete access to ourselves to raise any concerns they may have. We will always take their views and issues into consideration.

There is a need to keep the general public more informed.
We recognise this and although the website is open to the public there may well be a need to advertise the project more in the public domain. There have already been articles in Trade Press on the project.

Have the stakeholders been engaged early enough to have an influence?
We believe so. Any earlier in the project and we would not have been able to give many details on options as these are still being investigated. We are now at a stage where options are being considered, but nothing has been decided or finalised. This is the perfect time for stakeholder input. As we indicated in the workshop we are seeking input and are listening. This is an opportunity to influence direction.

It is difficult to imagine the scale of the problem. How big is the project?
Suggest the website is visited to get an overview of the scale of the project: www.shell.co.uk/expro/decommissioning

How much have the workforce been consulted?
There has been a general communication note to all offshore and onshore staff, together with advertising the website and a high profile article in the in-house Company Magazine. During this exercise, we have asked for comments/issues/concerns and feedback on the project. Offers have been made to staff and safety committees to present the project.

Better communication with the offshore workforce would make them feel more involved.

See above. The Brent Alpha installation manager is briefed by the project leader on a fortnightly basis and his input is taken into consideration in the development of the project scope. There has been communication offshore, but it is recognised that this may need further enhancing in the near future.

Consider a media campaign and articles in the press to advertise re-use opportunities more.
We recognise this and it will be considered with Trade and Local Press. However it should be also recognised that this project is "business as usual" and we may not be able to stimulate much media interest in the subject. Reuse opportunities are being investigated in the relevant civil and marine industries.

Why are there not any critical/opponent stakeholder groups at the meeting?
At the beginning of the project in 2002, over 100 stakeholders, representing over 90 organisations were identified, analysed and given a priority ranking. We targeted all the High Priority stakeholders (69) who included Greenpeace/FOE/WWF etc, and these were sent a letter of intent in April 2003. Of those 69 stakeholders, 43 noted an interest, including 23 who wished to become involved in further dialogue. Of those 23, 11 could make the meeting on the 15th July and 9 sent apologies. In addition to the initial letter of intent, another letter was sent to all those that had not replied. It may well be that this project is considered "business as usual" and does not stimulate much interest. We will shortly be sending out another letter to all other stakeholders we have identified as having an interest.

This is a relatively simple decommissioning project and should be presented as such.
See above on media campaign and public awareness.

It appears some Stakeholders are missing. On what basis was this group selected?
See above.

Senior Management (Decision Makers) need to be present at these meetings.
Senior Management have been involved in the approval process of the project. The Project Sponsor and Budget Holder, Chris Blaydon, was present at the meeting. As Business Improvement Manager for the Brent Field he holds high authority within the decision making process.

Is there scope for a generic (UKOOA) structure to stakeholder dialogue.

This is being pursued following comments at the meeting. We are making approaches to other operators to assist UKOOA in developing Guidelines which will include best practice/methodology and timeline.

Make sure the DTI is closely involved. Some thought their attendance was warranted at this event.
DTI were one of the 69 stakeholders identified as critical for dialogue. They have been sent letters of intent and these have been backed up by further correspondence. However the DTI have indicated that their involvement through ongoing meetings and discussions with the project during the decommissioning planning process is sufficient.

ANCHOR BLOCKS

What about the sediments to be disturbed?
We expect that removing the blocks and flare will result in sediment being re-suspended into the water column increasing the turbidity at the site. This will be a temporary phenomenon as suspended sediment will gradually fall back to the seabed. The disturbance will be within the normal range that marine organisms are likely to be exposed.

What is the scale and significance of any residues left behind following decommissioning?
We will be expected to leave the seabed in such a condition that it will not present a hazard to commercial fishing and shipping. Owing to the type of facilities and operation at the site, we do not expect any chemical residues to be present on the seabed.

Are there any contaminants on the original coatings? Is there any chemical concerns on coatings, sacrificial anodes, etc?
The Flare structure is protected from the splash zone up and within the floatation tank by coating systems. The structure was constructed 30 years ago (in 1973) and the coating systems in use at that time may have chemical (environmental and health) concerns that would preclude their use today. Precautions will have to be taken during decommissioning and disposal to ensure that any unacceptable coating systems are contained for proper disposal.
The section of the structure that is permanently submerged is not coated and it is protected by sacrificial anodes. There are 140 aluminium sacrificial anodes that range from being 25% to 75% depleted (last inspected in June 2003) spread along the length of the flare structure from just below the splash zone to the seabed. The anode material is recyclable and it is planned to be recovered to shore together with the rest of the structure for recycling.

Has Shell considered suction dredging beneath the blocks to sink them and then rock dump them?
Various offshore disposal methods, including dredging and rock dumping, was considered for the blocks in 1993. Subsequent legislation changed the context of this earlier study and offshore disposal options were eliminated in favour of either on shore disposal or re-use of the blocks if a suitable opportunity arises.

FLARE STRUCTURE

Do you have any more information on the flare base - description of and the technical challenges to be overcome?
The flare base consists of two 4.5m diameter steel cylinders of 30.5m length on two sides linked together by a lattice of steel beams and concrete. Its overall dimensions are 30.5m x 22.8m x 6.0m and weighs about 1000 tonnes if dry. The challenge is to free the base from the seabed suction and recover it in one piece safely to shore.

Why has the decision been taken to remove the flare?
The reasoning for this level of decommissioning is to avoid the risk of future failure of, say, the flare stack giving more serious problems. A deliberate planned removal is preferable.

What is in the flare ballast tanks?
The flare structure is ballasted at the bottom of the column by a concrete block of about 380 tonnes. The auxiliary steel ballast tanks fitted to the sides of the concrete block were flooded with seawater during the installation sequence. The steel ballast tanks on the base were also flooded during installation and are currently still filled with seawater. These ballast tanks have never been in contact with hydrocarbons.

Is there any marine fouling of the structures?
Yes, during the last structural inspection (carried out in Spring 2003), it was reported that marine growth coverage was of about14% hard growth (i.e. mussels, barnacles, tube worms, etc.) to a thickness of about 12mm and about 86% soft marine growth (sea anemones, kelp) to a thickness of about 75mm. Some of these will be stripped during the offshore removal operation and the remaining will be properly disposed of at the on shore disposal site.

PIPELINES

The threats of left pipelines to the fishing industry must be considered - e.g. Westhaven incident. Concern in the industry has resulted in some overtrawling trials on pipe bundles.

This type of incident and risk is always considered when deciding on any option for the pipelines. As mentioned above, the Scottish Fishermen's Federation (SFF) are consulted on a regular basis through the decommissioning process.

Do you have more information on the pipelines that are being left?

The line connecting the Brent Alpha platform to the remote flare is a 28" nominal diameter surface laid concrete-coated steel pipeline of approximately 3.1 km in length. It was brought into use in 1980 and was taken out of service in 2002. It will be flushed with seawater in 2004 in preparation for the removal of the flare structure.

The line connecting the Brent Bravo platform to the remote flare is a 36" nominal diameter surface laid concrete-coated steel pipeline of approximately 2.6 km in length. It was brought into use in 1976 and taken out of service in 1994. It will also be flushed with seawater in 2004 in preparation for the removal of the flare structure.

The pipelines to the Spar manifold have been re-configured for re-use as a water disposal route from Brent Alpha to the water treatment facilities in Brent Bravo and are not considered for decommissioning at this time.

What is the minimum requirement for leaving the pipelines in place?

Prior to leaving the pipelines in place, they would have to be flushed with sea water and positively isolated from the platform production system. The subsea ends of the pipelines would be capped and made safe so that they do not create snagging hazards for fishing gear. The entire length of the pipelines would be retained under Shell's long-term pipeline inspection and maintenance regime to ensure their fitness for potential future re-use opportunities or the final decommissioning solution.

How are you going to make the case for re-use and leaving the pipelines in-situ?

Pipelines are a valuable long-term investment with a variety of potential uses, not all of which can be readily foreseen at a particular time. The complex and evolving nature of the offshore oil and gas business means that such valuable offshore infrastructure, even if not in current use, should be maintained in a fit state for a potential future use - the re-use of the SPAR pipelines mentioned above is an example of this. As for the currently out of use pipelines around Brent, there are already several potential scenarios where they might be of use. As long as these pipelines are associated with an active and producing field, no decision on the final decommissioning option will be made.

How will you ensure greater transparency and clarity for the re-use of the pipelines option?
As previously stated, not all options for pipeline re-use can be identified far in advance. In the interim however, Shell will maintain these pipelines in a fit state for possible re-use.

REUSE OPPORTUNITIES

Have we fully explored the re-use opportunities?
Action arising from Shell's internal Sustainable Development workshop included development of scenarios for potential reuse and future use of anchor blocks and pipelines to be identified and recorded.

How much of a time-lag, in terms of material storage, is the project willing to accept in order to obtain the best option for re-use?
The project is currently actively looking for re-use opportunities for the concrete anchor blocks and will consider a firm re-use opportunity with a definite schedule which can be accommodated by the successful decommissioning contractor's resources and offshore removal schedule. It would be unacceptable to have to temporarily "park" the redundant items as this would incur double handling efforts, increase safety risk exposures and lead to the possibility of the items ending up abandoned after the hand-over.

Can the blocks be cut up into more useable blocks (100/200 tonnes etc)?
The blocks can be cut into smaller pieces when they are on-shore. If this is necessary for the re-use opportunity, they would then have to be transported to the re-use site and the implications of this would have to be considered. To cut the blocks while they are still on the seabed would involve more complicated equipment and would greatly increase the exposure to high risk activities such as diving and multiple underwater lifts.

Are these really the right materials for coast protection schemes? We need to be sure.
An appraisal on the re-use potential of the anchor blocks is currently being commissioned and this question is being addressed in the study.

What about contacting and working with Shell Renewables for re-use opportunities?
Shell Renewables has been approached and potential re-use opportunities are currently being reviewed.

Could the Spar anchor blocks be used as tidal funnels for tidal power schemes?

We are keen to seek suitably located and realistic re-use options that fit the project schedule for the anchor blocks. Various re-use options are currently being assessed. We do not know if the blocks are suitable as tidal funnels but we have included this in our list of potential solutions for review.

SUSTAINABLE DEVELOPMENT

Is Shell doing enough for the UK in terms of Sustainable Development? Social impact has not been considered for the project and this should be included in any decision making.
Two actions regarding this issue have been developed as a result of Shell's internal Sustainable Development Workshop. These are to initiate a high level social impact assessment and include a site-specific social impact assessment in execution contract scope of work.
A social impact study in accordance with the 'Social Impact Assessment: International Principles' prepared by the International Association of Impact Assessment will be carried out by an Independent Authority.

Why not use a different title than Sustainable Development?
Sustainable Development is a concept and a term that has been taken up by government, industry and the wider public. here is an expectation that companies will address the challenges that SD provides even though it might well mean different things to different businesses. We have interpreted Sustainable Development as it applies to an exploration and production company and see our role as doing everything we can to manage our hydrocarbon reserves in the most efficient way.

The problem here is "balance". How do we develop and use the tools to get the right balance for SD?
The SD approach that we adopt in Shell UK helps to make sure that projects have all of the information needed to make good business decisions by:
- building our SD requirements into appropriate decision making and approval points;
- having the people who make business decisions understand the wider context in which we operate.

Does SD apply to a sale of an asset such as Brent?
SD applies to all our acquisitions and divestments.

GENERIC

Decommissioning needs competition - don't send everything to Norway.

Agree. The Norwegian option is only one of several being considered, The final option will depend on several factors, including economics/safety/environment and technical feasibility.

Shell's bureaucratic decision-making process needs to be transparent. Has it changed since 1995?
We believe so. Decision-making is more focused than before, through the new processes in place. Details of how projects are approved and reviewed were given at the meeting. There is also more accountability for decision making lower down in the organisation.

Have decisions been taken already?
Some decisions have already been taken. For example we have decided that we will remove the blocks, the flare tower and its base and not leave them in-situ. This has been based on our preliminary option selection process. However, decisions have not been taken on how or when they will be decommissioned or where the facilities will be taken after removal from location. This depends on a variety of value drivers including stakeholder influence into the best option.

Have Shell learnt the lessons from Brent Spar?
Spar was not, as so many believe, an environmental problem, rather it will go down in history as a symbol of industry's inability to engage with the outside world. We learnt a lot from the issue in particular the fact that we must be open and transparent. In controversial matters, good science and regulatory compliance aren't enough. We must interest and inform people even if they initially seem to show little interest, and we must explain complex issues, but simply. It's a mistake to underestimate objections on principle, or the commitment of those who make them. Public perceptions may be driven by feelings not facts, and instinctive feelings matter. We must ensure that neither interest groups nor we waste money and energy in conflict. We also need to share and understand differing perspectives and independent third parties can help to build public trust. (Extracts from an interview in *Shell UK Focus*, Spring '98 issue).

Shell is still blinkered; there is a feeling that the decisions have already been taken.
See answer above on decisions.

The Opportunities/Project Management Process shows several check points, known as "Gates", at which points decisions are made regarding the progress of the project. Who sits on the "Gates", and on what basis are decisions made?

Typically senior members of the Shell UK Leadership Team ("Functional Managers") sit on these 'Gate' panels. Opportunities are assessed against so-called "TECOP" perspectives:
Technical, Economic, Commercial, Organisational and Political (includes social and environmental).

Is the fate of the entire Brent Asset currently under discussion? Has the future of the Brent Field been taken into consideration in this project?
Expro maintains strategic plans (known as Asset Reference Plans) for all its Assets, including Brent. This project and its associated interfaces, are included in these strategic plans.

How does Shell assess energy use in this decommissioning situation?
Energy usage is a key aspect of the environmental impact assessment process for the project. An assessment of the total net energy use for each of the options was made. This considered the energy usage for removal, transport, recycling/disposal and the energy required to replace "lost" recyclable material deliberately left in situ. These calculations are consistent with the Institute of Petroleum guidance, using values and factors for combustion and fuel consumption recommended in the guidance.

END OF RECORD

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Appendix E

Record of the Second Stakeholders Dialogue Session dated 10th December 2003

Minutes of Meeting

DATE & PLACE	10th December 2003- Shell Tullos		
ISSUE DATE	18 December 2003		
REPORTER	Phil Dyer	SUKEP	Ext 2986
PRESENT	**1st Stakeholder Session**		
	Anna Marshall	Shell- Environmental Advisor,	
	Phil Dyer	Shell- External Affairs,	
	Chris Gunstone	Shell- Brent Decommissioning Project Manager,	
	Ian Knox	DTI,	
	William Gan	Shell- Brent Decommissioning Project Lead,	
	Alistair McDougal	Shell- Asset Project Sponsor,	
	Paul Gaskell	Resource,	
	Sean Hughes	Genesis,	
	Murdo McIver	Shetland Decommissioning Company,	
	Alvaro Belloso	Shell- Brent Decommissioning Project,	
	Joanne McFadden	Scotoil- Business Development Manager,	
	Ed Smith	Dundee and Angus Oil Venture Group,	
	Brian Menzies	Enviro Centre- Regional Manager,	
	Phil Pritchard	Deep-Sea Recovery Ltd- Principal,	
	2nd Stakeholder Session		
	Duncan Cursiter	Shell- Fisheries Liaison Officer,	
	Paul Smy	Shell- Projects Manager,	
	Anna Marsall	Shell- Environmental Advisor	
	Dave Leech	Shell- Pipeline Projects,	
	Trevor Jones	Shell- Underwater Services,	
	Ali McDougal	Shell- Asset Sponsor,	
	William Gan	Shell- Brent Decommissioning Project Lead,	
	Phil Dyer	Shell- External Affairs,	
	Keith Mayo	DTI- Decommissioning Unit,	
	Chris Gunstone	Shell- Brent Decommissioning Project Manager,	
	Ray Johnstone	Marine Lab,	
	Zoe Crutchfield	JNCC,	
	Michael Sutherland	Scottish Fishing Federation,	
	Paul Abernethy	Scottish Enterprise- Energy Team	

- To ensure feedback on actions taken from the 1st Stakeholder Dialogue session is given
- To explain decisions taken and progress made
- To outline the timeline update and and process so far completed-including project sanction and award of contract
- To explain the options we have considered and the decision making process to date
- To update on the technical submissions received
- To give another opportunity for us to listen to stakeholders, identify any issues arising and consider any appropriate actions that may be carried out

PROJECT UPDATE – WILLIAM GAN

- The project has matured from concept to development stage.
- The scope has been defined and execution strategy developed.
- Project Manager appointed and taking ownership.
- Additional scope in development stage after considering input from 1st dialogue session.
- 1st draft Decommissioning Programme submitted to DTI.
- Proposals received and the solutions are being evaluated.
- Engineering work on topside and subsea preparatory work in progress.
- Ready for internal request for budget release and project approval pending discussion with Stakeholders.

FEEDBACK FROM FIRST STAKEHOLDER DIALOGUE EVENT – PHIL DYER

All actions arising from the first stakeholder dialogue event have either been close or are in the process of being closed.

Three main areas of pipeline strategy definition/ social impact studies and re-use opportunities are either completed or in process

Attendees were given overview of status of each action

PIPELINE STRATEGY AND PRINCIPLES – WILLIAM GAN

Definition:

- pipelines currently not in use / not required for production

Principle:

- final decommissioning decision at EOFL
- must not preclude future decommissioning options
- consider safety, cleanliness, integrity implications of proposal to remove a line from service and activities required to achieve it
- determine interim state pending full field decommissioning
- ensure any changes to existing status do not result in unacceptable / greater risk e.g. potential snagging

- clean line to an acceptable standard (preferably whilst all operating processes are still 'operational') and maintain record of cleanliness status achieved
- positively isolate from production facilities and leave in stable condition
- retain in inspection portfolio (risk based monitoring)
- where the requirement for end disconnection leaves an unacceptable potential snagging hazard, undertake remedial work (e.g. rock dump, mattress, bury) based on risk assessment

RE-USE PROJECTS AND SOCIAL INVESTMENT STUDIES – PHIL DYER

We intend to make the blocks available to a selected re-use organisations at no financial charge at the point of delivery or transfer.
We wish to make sure that re-use of these blocks is explored.
To achieve this a Marketing Brochure has been prepared and will be distributed as widely as possible to potential re-user organisations to inform them of the possibility of re-use and to provide sufficient information to allow project assessments to be made.
We will only consider a firm re-use opportunity with a definite schedule which can be accommodated by the selected decommissioning & removal contractor's resources and offshore removal schedule .
The brochure is being sent to a range of organisations, selected by Shell with advice from its consultants, WS Atkins, which are considered to have a possible interest in acquiring the anchor blocks for re-use, and which are considered to have the knowledge, expertise and capacity to incorporate the blocks into a suitable and beneficial Civil Engineering project.

Social Impact Study – Phil Dyer

Carried out by BMT Cordah consultancy – Completed November 2003.
Reference to the Social Impact Study can be made.
Conclusions:
Most impacts are short-term with some being beneficial and some being adverse.
The longer-term impacts are, overall, beneficial. No impacts can be considered to be significant with any degree of confidence as there is insufficient site-specific data to warrant assigning 'significance' to impacts.
The main area of uncertainty hinges on the probability, location and extent of any local oil/chemicalspill.
Site-specific EIA/SIAs will be able to determine impact significance in a more informed manner than is possible in this 'High Level' assessment.

TECHNICAL SUBMISSIONS AND PROJECT UPDATE – CHRIS GUNSTONE

Several decommissioning proposals received in response to tenders

Options are selected from those shown on the Shell website

Anchor block removal

Direct crane lift and transported to shore on barge

Recycling proposed

Option to Re-use the anchor blocks under study.

Work to be carried out in 2004 or 2005.

Time Line and Next Steps– Chris Gunstone – Project Manager

Technical review of proposals 10th –12th December.

Internal approval to proceed with project aimed for 17th December

Funding approval January 2004

Contract award for detail engineering of decommissioning in Quarter 1 2004

But condition is: that proposals have been discussed with Stakeholders and any concerns raised are addressed.

Decommissioning Programme to be published for statutory consultation in February 2004

Approval aimed for May 2004

Offshore preparation would commence in June 2004

Brent South Wells – Chris Gunstone – Project Manager

As part of the overall project and included in EIA but not part of Decommissioning Programme:

3 Brent South subsea wells will be abandoned

Flowlines disconnected

Umbilical disconnected

Wells permanently plugged

Well heads and bases recovered

Pipelines made safe under IPR

2nd Stakeholder Session 1200-1400

Attendees as per Page 1

PRESENTATION AS PER AM SESSION GIVEN TO ATTENDEES

Questions Arising from Session 1 and Session 2:

Q1) What about synergies for decommissioning as a whole- campaigns etc?- Ian Knox DTI

A1) The decommissioning of the Flare and anchor blocks is required by the end of 2005 and the best way of obtaining synergy for these rather unusual installations is to maximise schedule flexibility and permit the contractors to offer the best overall plan.

Q2) Was the project team aware that there was a joint industry project sponsored by EERG looking at pipeline re-use and a consultation document had been issued. This was looking at the generic picture and not case by case?- Ian Knox DTI

A2) No- but appreciated the update and thanked Ian for offer of providing more details.

Q3) Does the date of 16th January mean people will have to submit a firm proposal – Brian Menzies – Envirocentre

A3) No, we just need notes of interest only by that date

Q4) What do you mean by "free at point of delivery"? Are you willing to pay? -Brian Menzies – Envirocentre

A4) Until it is clear whether there are real options this cannot be resolved. However it is likely that the avoidance of destruction of the blocks will have some financial benefit which may give room for discussion.

Q5) Is there any evidence of the blocks integrity at the moment?- Murdo McIver - SDC

A5) The blocks have been regularly inspected and the latest underwater inspection in May 2003 indicated that they are in good conditions, apart from the known damaged lifting point on one of the blocks.

Q6) Are the blocks designated as waste? – Sean Hughes – Genesis

A6) If the blocks are to be reused and they are not going through a Waste Company then they will not be classed as waste. If we are paying a company to reuse the blocks they are not classed as waste.

If the blocks go through a Waste Company and we pay them, then they would have to be declared as waste

Q7) What about marine growth on the blocks? – Ian Knox – DTI

A7) Underwater inspections indicated that there are minimal marine growth covering the surface of the blocks. This is due to the low sunlight at such water depth

Q8) Is there any radioactive material present in the flare?- Sean Hughes – Genesis

A8) There has not been any radioactive material detected in the flare. There is also no radioactive material detected on the mother platforms in the pipings leading to the remote flare. Radioactive material

A10) Discussions are underway with the regulator.

Q11) It seems that UK SME's are being left out in the cold yet again. All the Lion's share is going to the heavy lift operators. Are Shell going to make sure that sub-contracting strategy for the main contractor is open and will give UK operators a chance?

A11) There are no undue restrictions and it is likely that a significant part of the work will be subcontracted in the UK.

Q12) Will the blocks go on to barges? – Ian Knox –DTI

A12) No – they will go on the back of the HLV

Q13) It seems that the options are being driven by the HLV base port and so UK companies are disadvantaged. Is this right? – Ian Knox – DTI

A13) It is clear that the deep water available at quays in Norway is a significant advantage.

Q14) Can Shell separate the heavy lift operations from the onshore operations?-Paul Gaskell - Resource

A14) We have not seen this as beneficial in overall environmental terms.

Q15) Are the options for the blocks influenced by the HL Operators?- Brian Menzies – Envirocentre

A15) In respect of disposal as waste, yes.

Q16) Do we have a fall back position if there is no re-use opportunity suitable? – Sean Hughes – Genesis

A16) Disposal as waste

Q17) What are the delivery dates for re-use? Sean Hughes – Genesis

A17) This is being kept flexible and is 2004 or 2005 depending on the contract award.

Q18) Is there a detailed engineering contract within the HL Contracts? – Ian Knox- DTI

A18) Yes.

Q19) With respect to the tender- is it clear for the bidders that if an option comes up in the UK for reuse they will be flexible in their approach? – Paul Gaskell – Resource

A19) That will be Shell decision and we will have an option in the contract.

Q20) What is the practical loss to UK for not getting the work. For example Scotoil- it means a lot to their business- Ian Knox – DTI

A20) The element related to disposal should be relatively small. The cost of forcing the UK option is likely to be significant.

A22) Shell cannot directly control this but from review of the tenders it is clear that a significant element of the work will be subcontracted.

Q23) What about using a UK based engineering firm (Amec etc) to carry out project management. Shell seem to have gone for the easy option and gone to Norway. It seems that Shell did not take into account a broad enough approach to find the solution. There is a need to break the mould. There is a fear in the contracting community that SME's will not be able to break through. We have had discussions before with Shell on this subject and nothing seems to have changed.

A23) A significant amount of work to determine the options and contract strategy has been carried out by WSAtkins working for Shell.

Q24) How will Shell inspect the pipelines, if they are isolated? Zoe Crutchfield JNCC

A24) The pipelines will continue to be inspected externally by Remotely Operated Vehicles and side scan sonar techniques. The frequency of the inspection will be determined according to a risked based inspection technique. None of the pipelines have been design for internal inspection.

Q25) Given the Projects desire to consider re-use option for the flare pipelines, there is a need to deal with the public perception issue of leaving on the seabed. There is a need to submit a good re-use case which needs to be robust. Need to outline the case for leaving in place, which needs to be properly addressed and described- Ray Johnstone Marine Lab

A25) Due to the fact that the flare pipelines are only rated to 10.3 bar they would not be suitable for high pressure service but this still does not preclude their potential re-use. They, for example can be used for what the Spar pipelines are being used for i.e. oily water return lines to BB where the treatment facilities are. This is the likely scenario. Brent Alpha will have a greater level of oily water drainage requirements in the future. The project will be tieing the pipelines together anyway which will facilitate this. The specification does not invalidate our "out-of-use pipeline principles".

Q26) Will Shell consider re-use for 2 or 3 of the blocks or does it have to be all 6? - Keith Mayo – DTI

A26) Yes we will consider any number, but 6 will be ideal

Q27) Are Shell looking at H/L Synergies?- Michael Sutherland – SFF

A27) We will be flexible with the schedule to allow for a better price. However, we don't want to tie

Q29) How big is the cuttings pile and what is the profile- Michael Sutherland – SFF

A29) Sonargraphic survey in 1997 indicated that the cuttings pile covered an area of 8,980 square metres. The volume of the pile was estimated to be 2,300 to 4,200 cubic metres with a maximum thickness of 1.7m at the wells

Q30) What about removal of the 500 metre zone? – Duncan Cursiter – Shell

A30) We believe that we will have to apply to have the zone rescinded and we need to talk to the HSE and notify the Hydrographer of the Navy also.

Q31) Both options seem to include Norway. How can the UK contractors maximise their opportunities? – Paul Abernethy – Scottish Enterprise

A31) The contractors have to continue to make the main contractors aware of their capabilities.

Q32) What other opportunities are there for contractors? Paul Abernethy – Scottish Enterprise

A32) We need to maximise our current supply chain. Supporting subsea and topsides work will be carried out by Sigma3 and the new Underwater services contractor.

Q33) The anchor blocks strategy is very positive, it is great to make progress on this and the flare disposal. We can live with the pipelines remaining in situ until end of field life, but there does need to be a robust case for re-use on the table to support this. We want to see the seabed back to the status –quo. What are you going to do about ensuring that area is safe to trawl? – Michael Sutherland SFF

A33) We will ensure surveys are carried out to check whether everything in the area has been removed and ensure there is no snagging.

General comments on re-use:

- Common sense approach – good to see it being persued- SFF
- Happy to see the options for re-use give a deadline, this makes sense – DTI

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Appendix F

List of Statutory Consultees from DTI

i) The National Federation of Fishermen's Organisations
NFFO Offices
Marsden Road
Fish Docks
Grimsby
DN31 3SG
(Tel: 01472 352141)

ii) Scottish Fishermen's Federation
14 Regent Quay
Aberdeen
AB11 5AE
(Tel: 01224 582583)

iii) Northern Ireland Fishermen's Federation
1 Coastguard Cottages
The Harbour
Port Avogie
County Down
BT22 1EA
(Attn. Mr. Richard James, tel. 02842 771954)

iv) UK Cable Protection Committee
Ms Caroline Barker
c/o Global Marine Systems Ltd.
East Saxon House
27 Duke Street
Chelmsford
Essex
CM1 1HT
(Attn. Mr. Nigel Irvine, Global Permitting & Liaison Manager, tel. 01245 703349)

Letter sent to Statutory Consultees on 6 February 2004

Dear Sir,

Brent Redundant Facilities Decommissioning – Statutory Consultation

Please find enclosed a hard copy of the Decommissioning Programmes for the Brent Redundant Facilities.

As you will know, under the requirements of section 29 (3) of the Petroleum Act 1998 and in accordance with the DTI's Decommissioning Guidance Notes for Industry, statutory consultees have 30 days in which to provide comments on the Decommissioning Programmes to us. The official period for consultation will begin Monday 9th February 2004 and end on Friday 12th March 2004. We are sending you the document in advance to ensure you have ample time.

The Decommissioning Programmes cover the complete removal to shore and dismantling of the redundant Brent Remote Flare structure and the six concrete Anchor Blocks remaining after the removal of the Brent floating SPAR. They do not include the associated pipelines which are covered under the Interim Pipelines Regime. However, for completeness and in order to ensure full understanding of the decommissioning activities, the pipelines are discussed under the associated sections of the Decommissioning Programmes.

The decommissioning of the Brent Remote Flare and Anchor Blocks will be carried out in the following phases:

- Pre-decommissioning surveys and engineering development studies
- Removal of hydrocarbons
- Removal and recovery of structures and equipment
- Post-removal survey
- On shore dismantling

Negotiations are in progress with interested parties who have the potential to re-deploy the Anchor Blocks which would result in their re-use.

This Decommissioning Programmes are consistent with OSPAR Decision 98/3. No derogation from OSPAR Decision 98/3 is sought.

I would be grateful if you would send me your comments to the address above. If you have any queries or concerns in the meantime, please do not hesitate to contact me.

We look forward to receiving any comments you may have before the end of the consultation period.

List of local and national newspapers where the Public Notices were published

(i) Edinburgh Gazette - Scottish Waters only.

(ii) Aberdeen Press and Journal - Scottish Waters only.

(iii) Shetland Times - only for projects in NNS i.e. Waters near Shetland.

(iv) A National newspaper (The Guardian was selected) - All cases.

Public Notice published in newspapers in the week of 9 February 2004

PUBLIC NOTICE

The Petroleum Act 1998

BRENT REDUNDANT FACILITIES DECOMMISSIONING

Shell U.K. Limited has submitted, for the consideration of the Secretary of State for Trade and Industry, the draft Decommissioning Programmes for the Brent Redundant Facilities in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

These facilities are no longer required for the continuing operation and production of the Brent Field. The items/facilities covered by the Decommissioning Programmes are for the removal to shore and dismantling of the redundant Brent Remote Flare structure and the six concrete Anchor Blocks remaining after the removal of the Brent floating oil storage unit. The Brent Remote Flare is an articulated buoyant steel frame structure installed in 1975 to serve the Brent Alpha and Bravo platforms. Its position is N 061° 02' 46" E 001° 45' 26". The Anchor Blocks are six identical reinforced concrete blocks installed in 1976 in the Brent Field, Block 211/29, to serve as the gravity anchor system for the SPAR floating storage tank. The decommissioning of these facilities does not impact on future production from the Brent Field.

Shell U.K. Limited hereby gives notice that a summary of the Brent Redundant Facilities Decommissioning Programmes can be viewed on www.shell.co.uk/expro/decommissioning.

Alternatively a hard copy of the Programmes can be inspected by contacting Phil Dyer, External Affairs, at the following location during office hours.

Shell U.K. Limited
1, Altens Farm Road
Nigg
Aberdeen
AB12 3FY
Tel. 01224 882000

Representations regarding the Brent Redundant Facilities Decommissioning Programmes should be submitted in writing to Mr. R. Hemmings, Decommissioning Manager at the above address where they should be received by 12th March 2004 and should state the grounds upon which any representations are being made.

Date: 9th February 2004

Record of Responses from the Statutory Consultees

(Refer to separate attached letters)