TOTAL E&P UK Ltd
WEST FRANKLIN PHASE II DEVELOPMENT ENVIRONMENTAL STATEMENT

To: Sarah Pritchard

From: Evelyn Pizzolla
Date: November 2010

ES Title:	**WEST FRANKLIN PHASE II DEVELOPMENT**
Operator:	**TOTAL E&P UK Ltd**
Consultants:	Xodus AURORA
Field Group (DECC):	Aberdeen
ES Report No:	D/4073/2010
ES Date:	06 April 2010
Block Nos:	29/05
Development Type:	Phase II Development of the West Franklin field with installation of a Normally Unattended Installation (NUI) tied back via a multiphase pipeline to the Elgin Complex.

Project overview

TOTAL is planning to develop the western margin of the Franklin Field, known as West Franklin, in Block 29/05 of the central North Sea, located 233km off the East coast of Scotland and approximately 38 km from the UK/Norway median line. The planned development is approximately 6 km south of the established Elgin Complex. Here production from the Franklin Wellhead Platform (FHP) and Elgin Wellhead Platform (EWP) is processed at the Production, Utilities and Quarters platform (Elgin PUQ). Gas is exported via the 34" SEAL pipeline to Bacton and liquids are transported through the Forties Pipeline System.

The West Franklin area covers approximately 4km^2, with the main producing gas condensate reservoirs located at an average depth of 6000 - 6500 m. Reservoir pressures of c 1,100 barg and temperatures of 190^{o}C are considered high pressure, high temperature (HPHT).

Phase II development at West Franklin will begin with fabrication, installation and commissioning of facilities from 2010 until late 2013. The West Franklin WHP will have 12 slots available for new wells with a base case for the drilling of three wells to commence in 2010 and continue through to 2012. First production is expected in the 4th Quarter of 2013 with an estimated field life of 25 years.

Project Description

Following extensive concept development the Phase II development of the Franklin field will require the installation of a NUI Wellhead Platform and a 6.2km pipeline from the NUI to the Elgin PUQ via the Elgin Wellhead platform which will utilise existing export facilities.

Platform facilities
Three development concepts were considered:

i) Drilling from the existing FWP using Extended Reach Drilling (ERD);
   - ERD was dismissed as there is currently no slot availability at the FWP and as there are significant technical difficulties associated with drilling such a large step out it was deemed unlikely to reach the target safely.

ii) Subsea development;
   - A subsea development was also dismissed as the very high HP/HT conditions experienced in the West Franklin reservoirs would challenge current technology.

Additionally, it was considered that a subsea development would incur a larger seabed footprint than a WHP.

iii) Installing new wellhead platform(s)
- A new WHP would utilise proven technology, allow pre-drilling of production wells to assess reservoir complexities and facilitate the development of remaining resources and other potential exploration targets in the area.

Following acceptance of the WHP option further development options were considered; a NUI, a manned WHP or a double jacket manned WHP. The three options were ranked using accepted environmental criteria which eliminated the double jacket option and the NUI was finally accepted taking the added weighting of overall health & safety into account.

Tie-back host selection

Two tie-back options, either to the Elgin WHP or the Franklin WHP, were then considered. No significant differences in environmental terms were identified and the decision to tie-back to the Elgin WHP was made on the basis of issues with facilities integration and potential back-out effects on Franklin and West Franklin wells.

Pipeline selection

Pipeline options considered included either a single 16" or 2 x 12" lines. The 16" line would require lower resource use/emissions during installation but would need large cooling spools impacting seabed area and future operational impacts with slugging were considered. The 12" lines would produce greater installation emissions but offer greater operational flexibility throughout field life thus reducing emissions long term. Both options would also require the installation of a an umbilical and a power cable. Total have chosen the 2 x 12" option but are still considering either a bundle or conventional pipelay option.

Pressure relief

Two main options were considered to provide pressure relief from the NUI;

i) Conventional mechanical relief with a test separator and flare system;
- Mechanical relief using a flare system is reliable and provides operational flexibility. However, this would require a topsides High Pressure/Low Pressure (HP/HL) interface and increased emissions from flaring. Although it may be possible to reduce those emissions by use of a normally unlit system, prolonged flaring would require an Over Pressure Protection System (OPPS) to ensure acceptable safety levels.

ii) High Integrity Pressure Protection Relief System (HIPPS)
- A HIPPS system removes the requirement for a HP/HL interface and reduces the requirement for flaring/venting and associated emissions. Simpler and more robust than the OPPS protected flaring system this is the preferred pressure relief option.

Key Environmental Sensitivities

The EIA identified the following environmental sensitivities

- Highest seabird vulnerability occurs in January and November
- Occurrences of cetaceans, including several species of whale and dolphin
- Fishing effort is low throughout the year
- Transboundary impacts

Key Potential Environmental Impacts

The EIA identified the following potential environmental impacts

- Seabed impacts
- Marine discharges

- Atmospheric Emissions
- Accidental hydrocarbon spills
- Underwater noise

Seabed impacts

The spudcans of the jack-up drilling rig will temporarily create a loss of habitat but this will recover when the rig is removed. The installation of the jacket will incur permanent loss of habitat under the legs however, it will introduce a new hard substrate for colonisation by alternative species.

Drill cuttings from top hole 36" sections drilled with Water Based Mud (WBM) will be discharged at the seabed and cause localised smothering.

Impacts from pipe-lay will differ and be dependent on installation method. Conventional lay will require trenching resulting in loss of habitat and smothering from sediment suspension/resettlement. Rock placement to prevent upheaval buckling and damage by fishing trawls will also lead to loss of habitat but has the potential to provide an alternative substrate for colonisation. The impacts from a bundle option will be limited to smothering directly underneath the line placed directly on the seabed without the need for additional protection.

Use of an anchored Flotel may disturb and suspend sediments and the removal of the anchors may create permanent scars or anchor mounds. Impacts should be temporary and re-colonisation is expected to occur relatively quickly.

Total will employ mitigation measures such as using dynamically positioned rather than anchor held vessels where possible and optimise rock volumes during the design phase and use controlled fall pipes to minimise seabed spread if rock is required.

Environmental survey work has indicated that no seabed habitats currently considered sensitive in conservation terms occur in the area. In addition, relevant permits and approval will be in place prior to any activity being carried out and combined with relevant mitigation measures any impacts should be few in number, small in scale, temporary in nature and subject to rapid recovery.

Marine discharges

Cuttings from 26"sections drilled using WBM will be discharged into the water column and dispersed and not expected to have a significant impact. Cuttings from all other sections drilled with Oil Based Mud (OBM) will not be discharged.

Topsides and Pipeline commissioning chemicals will be discharged to the marine environment . The exact chemical suite to be used will be finalised during detailed design and will be the subject of a detailed risk assessment. The volumes of chemicals to be discharged will be low and will be rapidly dispersed by local currents so the expected environmental impact will be insignificant.

Produced water from West Franklin will be handled at the PUQ where the use of new Compact Flotation Units is expected to limit the requirement for additional chemical treatment and maintain an average of 20mg/l dispersed oil in water which is below current requirements.

Atmospheric emissions

Sources of atmospheric emissions will come from vessel activities during installation and commissioning; drilling and well testing; and operational activities. Vessels employed will comply with relevant shipping regulations and combustion equipment will be subject to regular monitoring and inspection to ensure efficiency. Green burners will be used for well testing to reduce levels of unburnt hydrocarbons and pollutants entering the environment. All routine power requirements for the Phase II development will be via a power cable from the Elgin facilities and this will be met without increasing the power generation capacity, thus emissions will not increase above historical peaks. In addition regular energy efficiency reviews will be conducted to identify opportunities to further reduce emissions.

Accidental hydrocarbon spills

The export pipeline will be transporting dry gas/condensate and therefore there is low risk of a hydrocarbon spill from the line. However, volume of $100m^3$ per hour has been assessed as the maximum rate of condensate that could be released from an uncontrolled blow-out. Modelling has

indicated that condensate could potentially reach coastal locations in the UK or Norway, but that scenario would be heavily dependent on meteorological conditions. Any spill would be highly fluid and volatile, evaporating quickly. Beached condensate would be expected to have a low level of persistence. The installations vessels will carry diesel and marine heavy fuel oil, however, it is considered unlikely that a spill could occur. Detailed spill prevention measures will be enforced prior to any operations commencing, and a detailed Oil Pollution Emergency Plan (OPEP) will be submitted to the regulator for approval.

Underwater Noise

Noise generation from the West Franklin offshore activities will include, vessel movements, pipe-lay activities, and potential pile driving. These activities may have the potential to impact mainly upon cetaceans and seals. Pipe-lay and other vessels may make use of Dynamic Positioning (DP), involving the use of thrusters and therefore likely to result in increased noise levels. However, due to its offshore location any marine mammal will be able to move away from the sound source.

Four foundation piles will be used to fix the jacket into place over a relatively short duration of approximately six hours per pile. Modelling indicates that marine mammals within 19km of the sound may exhibit avoidance behaviour but individuals or populations should not be adversely impacted.

A Vertical Seismic Profile may be used to determine further geological information of the wells which could have a similar impact as piling operations. However, in both cases Total will employ a Marine Mammal Observer (MMO) and a soft start procedure to minimise any disturbance.

Transboundary effects

The West Franklin development will be approximately 38km from the UK/Norwegian median line. However the development is not expected to result in any physical transboundary impacts and although the prevailing wind and weather conditions are towards the median line the dispersive nature of the marine environment should ensure any impacts would be negligible.

Public Consultation: No comments were received as a result of the public consultation.

Consultee(s):

The statutory consultees for this project were Marine Scotland (MS), and JNCC. They were requested to comment on the ES. The following comments were made:

Marine Scotland

Marine Scotland (MS) commented that in their opinion the impacts from the development and installation of the pipeline was well described and acceptable but noted an inconsistency in the fisheries data in Tables 4 and 4.3 to be amended accordingly.
MS requested copies of the final survey report to be provided when available.
Overall, MS were content for the ES to receive approval.

JNCC:

JNCC considered that the development, was unlikely to have a significant environmental impact on the nature conservation value of the marine environment. JNCC noted that Total had committed to implementing mitigation measures to minimise the risk of injury to marine mammals.
On the basis of the information provided in the ES, JNCC were content for the ES to be approved.

Further Information:

DECC requested the following further information:
LED noted that Total referred to the West Franklin field and quoted production figures from the Phase II development wells from West Franklin and from 2012. However, the Production Consent for the Franklin field would include West Franklin so Total were asked to compare total production with the existing production consent from 2010 and correct a typing error in the Tables.
OED requested further clarification on the tie-back option and the impacts of produced water at the Elgin PUQ.
OED asked for further clarification on the environmental impacts of conventional or bundle pipelay and the feasibility for decommissioning of either option.
OED asked Total to explain how they calculated the maximum condensate release volume in their blow-out scenario.

Total provide further information and clarification in an Additional Information document 14 October and this was forwarded to the Consultees for further comment. Both JNCC and MS were content with the additional information. Total provided a further Update 0n the 25th October to address the Production Consent figures and LED confirmed that the values and timelines now accorded with the FDP addendum.

Conclusion(s):

Following consultation, DECC and its consultees are satisfied that, with the implementation of mitigation measures in defined areas, this project is not likely to have a significant impact on the receiving environment, including any sites or species protected under the Habitats Regulations.

Recommendation(s):

On the basis of the information presented within the ES and advice from consultees it is recommended that the ES should be approved.

Sarah Pritchard *08/11/2010*

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Sarah Pritchard **Date**