1. PURPOSE OF THE MEETING

The purpose of the workshop was to engage stakeholders in a comparative assessment (CA) workshop of the options to decommission subsea infrastructure associated with the Dunlin, Osprey and Merlin Fields. The outputs from the meeting were recommended methodologies for inclusion in the relevant Decommissioning Programmes for public consultation.

2. INTRODUCTIONS

FEL thanked stakeholders for taking time to attend the workshop and reading the CA recommendations and supporting analysis which had been issued in advance. Each participant was introduced.

3. COMPARATIVE ASSESSMENT PROCESS

Xodus described the CA process undertaken and confirmed that it is aligned to the CA guidelines issued by Oil and Gas UK. It was explained that six key CA recommendations would be made during the workshop. The recommendations will then also be applied to any analogous subsea infrastructure. The limits for the workshop were confirmed as subsea infrastructure only, the Dunlin CGBS will the subject of a separate CA.
The evaluation criteria are aligned to the BEIS ODU and OGUK Guidelines, namely Safety, Environmental, Technical, Societal and Economics. The criteria have been assessed using the Xodus “Pairwise” methodology and weighted equally.

For each decision a sensitivity analysis excluding the Economics criterion, has also been prepared. It was noted that removing Economics did not change the recommendation for any removal decision.

Xodus also advised that a Quantitative Risk Analysis (QRA) workshop in relation to the impact on fishing for each option is to be held week commencing 16th January 2017. Stakeholders will be advised of the QRA output and any impact on the CA recommendations.

3.1 Merlin Field

3.1.1 Merlin Trenched and Rock-Dumped Pipelines and Umbilicals

FEL described the scope and status of the Merlin Trenched and Rock-Dumped Pipeline (PL1555) and Umbilical (PL1557) and reminded attendees that full removal had previously been recommended for most of the other Merlin infrastructure groupings. FEL explained that three options were assessed for Merlin Trenched and Rock-Dumped Pipelines and Umbilicals which had not been not previously identified for full removal.

The options are:

- **Option 1** - Leave in situ, remove ends, rock placement over snag hazards and areas of low cover.
- **Option 2** - Leave in situ, remove all exposures, rock placement over snag hazards and areas of low cover.
- **Option 3** - Leave in situ, back-fill trench using existing berm.

Xodus presented the assessment of the options against the five criteria.

JNCC asked if the CA takes into consideration impacts of future monitoring requirements and impacts to future users of the sea if infrastructure is left in situ. Xodus confirmed that the assessments include future impacts for up to 50 years for the purposes of comparative assessment.

SFF stated that option 3 would improve future fishing risk exposure, whereas options 1 and 2 have a neutral effect. Xodus updated the assessment accordingly.

Marine Scotland (MS) observed that the Oil Pipeline contains around 5 tonnes of LSA scale. **FEL committed to verify any relevant regulatory requirements in relation to the LSA scale.**

FEL explained that the trench berms have a typical gradient of 1 in 8 and a height of less than 0.6m which is within over-trawl parameters. **FEL committed to issuing the berm analysis data to stakeholders.**

The overall result of the CA is that Option 1 is the recommended decision. Merlin Trenched and Rock-Dumped Pipeline and Umbilical (PL1555 and PL...
3.1.2 Merlin Trenched and Buried Pipelines

FEL described the scope and status of the Merlin Trenched and Buried Pipeline (PL1665). FEL explained that three options were assessed for PL1665 which had not been previously identified for full removal.

The options are:

- **Option 1** - Leave in situ, remove ends, rock placement over snag hazards and areas of low cover.
- **Option 2** - Leave in situ, remove all exposures, rock placement on snag hazards and areas of low cover.
- **Option 3** - Full removal, reverse reel.

Xodus presented the assessment of the options against the five criteria.

JNCC asked why there were free spans and areas of low burial, was it due to the target burial depth not being achieved during laying or due to subsequent sediment movement. FEL advised that it was not certain and that this had happened prior to FEL taking Operatorship and further confirmed there had been no change in the nine years since. MS observed that these pipelines had not had rock placement which may be a contributory factor.

In response to a question from MS, SFF and FEL confirmed that if the pipeline is removed then an over-trawl check will be required.

The overall result of the CA is that Option 3 is the recommended decision. Merlin Trenched and Buried Pipeline PL1665 should be removed by reverse reeling followed by a sea-bed survey.

3.2 Osprey Field

3.2.1 Osprey Bundles

FEL described the scope and status of the Osprey North and South Bundles and reminded attendees that full removal had previously been recommended for most other Osprey infrastructure groupings. FEL explained that six options were assessed for the Bundles which had not been previously identified for full removal.

The options are:

- **Option 1** - Leave in situ, remove towheads, rock placement over snag hazards and areas of potential span growth.
- **Option 1A** - Leave in situ, remove towheads, rock placement over snag hazards and areas of potential span growth. Return after 30 years and place rock over entire length.
- **Option 1B** - Leave in situ, remove towheads, rock placement over snag hazards and areas of potential span growth. Return after 30 years, cut bundle into 20m lengths and recover to shore.
**Option 2** - Leave in situ, remove towheads, rock placement over entire length.

**Option 3** - Leave in situ, remove towheads, cut bundle into 350m lengths, pull bundles into pre-cut trench and backfill with spoil.

**Option 4** - Full removal, cut into 20m lengths and lift, recover to shore.

Xodus presented the assessment of the options against the five criteria.

FEL confirmed that for the options where the bundle remains in situ there will be regular future monitoring. FEL confirmed that their current understanding is that in around 30 years time the bundle would begin to lose structural integrity and therefore could become a safety risk for fishermen.

Xodus observed that safety exposure and technological feasibility and maturity were the key drivers impacting the CA. A discussion followed on the likelihood of safety exposure and technology changing over the next 30 years. FEL said that they would monitor industry progress.

SFF stated that they did not want option 1 to be the final outcome as it presents a future risk to fishermen. SFF asked if a removal trial could be undertaken on the smaller section of the North Bundle. FEL responded that such a trial would not prove the concept for the entirety of the two bundles and that research and development funds are not available, given the industry challenge of reducing decommissioning cost. SFF observed that the height of rock placement over the entire length would be substantial but still could be over-trawled. Xodus commented that the upcoming fishing impact QRA would provide a more detailed assessment.

SFF asked if the bundle could be refloated. FEL commented that refloating had been ruled out at the screening workshop in March 2016 due to the integrity of the bundle internals and lack of onshore landing facilities.

MS commented that there needs to be industry wide research into bundle removal and that technology would not improve unless there was a driver to do so.

JNCC also stated that industry leadership is required and that rock placement is a sub-optimal solution. JNCC further commented that leaving the bundle in situ, without significant rock placement allows more time for the Regulator and the wider industry to find better solutions. MS questioned how BEIS are considering the removal of old bundles across Operators.

OGA asked how long the bundle will last prior to decomposition commencing. FEL responded approximately 30 years based on the results of an Xodus material degradation study.

BEIS confirmed that subsequent to the Osprey Bundle installation, subsea bundles must be designed with a recovery methodology.

The overall result of the CA is that Option 1 is the recommended decision. The Osprey Bundles should be left in situ, towheads removed and rock placed over snag hazards and areas of potential span growth, followed by a sea-bed survey and trawl sweep.
3.2.2 Osprey Trenched and Rock Dumped Umbilicals

FEL described the scope and status of the Osprey Trenched and Rock-Dumped Umbilicals (PL736 and PL1545). FEL explained that three options were assessed for PL736 and PL1545 which had not been previously identified for full removal.

The options are:

Option 1 - Leave in situ, remove exposed ends, rock placement over snag hazards and areas of low cover.
Option 2 - Leave in situ, remove all exposed ends, rock placement over entire length.
Option 3 - Full removal, reverse reel.

Xodus presented the assessment of the options against the five criteria.

OGA asked if PL736 would have to be de-buried to allow for reverse reeling. FEL confirmed that de-burial would be required.

MS asked if BEIS Guidelines required pipelines to be buried. It was confirmed that BEIS Guidelines require pipelines to be trenched or buried to a depth of 0.6m below the sea-bed.

SFF asked about the profile of the PL1545 trench. FEL responded that the data is available and will be included in the fishing impact QRA.

The overall result of the CA is that Option 1 is the recommended decision. Osprey Trenched and Rock-Dumped Umbilicals (PL736 and PL1545) should be left in situ, the exposed ends removed and rock placed over snag hazards and areas of low cover followed by a sea-bed survey and trawl sweep.

3.3 Dunlin Field

3.3.1 Dunlin Rigid Risers

FEL described the scope and status of the Dunlin Rigid Risers. FEL explained that two options were assessed for the Risers.

The options are:

Option 1 - Leave in situ, riser cut at J-tube exit, outboard section recovered and J-tube sealed.
Option 2 - Full removal, outboard section cut and recovered, remaining section removed via topside.

Xodus presented the assessment of the options against the five criteria.

The overall result of the CA is that Option 1 is the recommended decision. The Dunlin Rigid Risers will be left in situ within the J-tube, the riser will be cut at the J-tube exit by a DSV, the J-tube will be sealed and the outboard section recovered to shore.
3.3.2 - Trenched and Buried Cable

FEL described the scope and status of the Dunlin Power Import Cable. FEL explained that three options were assessed for the Cable Risers.

The options are:

**Option 1** - Leave in situ, remove all cable transitions, rock placement over snag hazards and areas of low cover.

**Option 2** - Leave in situ, remove all cable transitions and exposures, rock placement over snag hazards and areas of low cover.

**Option 3** - Full removal, reverse reel

Xodus presented the assessment of the options against the five criteria.

The overall result of the CA is that Option 1 is the recommended decision. The Dunlin Power import Cable should be left in situ, cable transitions removed and rock placed over snag hazards and areas of low burial depth followed by a sea-bed survey and trawl sweep.

4 Next Steps

FEL thanked meeting attendees for their participation in the CA Workshop and reviewing the extensive pre-read materials. The fishing impact QRA will be undertaken week commencing 16th January and FEL will re-engage with the stakeholders should the QRA change the CA recommendations. Decommissioning Programmes will be updated with the CA recommendations in preparation for Public Consultation.

5 Post-Meeting Notes

On reviewing the minutes the SFF made three observations:

The SFF would like to highlight that for a number of the CAs considered, the overall option recommended was not the SFF’s preference.

The SFF noted that removing the evaluation criteria of Economics did not change the recommendation for any removal decision, however the SFF also note that for the six separate Comparative Assessments reviewed, the chosen decommissioning option was the least expensive option on each occasion.

The SFF has concerns re the statement made in Section 3.2.2. (Osprey Trenched and Rock Dumped Umbilicals), that ‘BEIS Guidelines require pipelines to be trenched or buried to a depth of 0.6m below the sea-bed’ and will be seeking clarification with BEIS on this matter – it is felt that leaving pipelines or umbilicals uncovered in an open trench would pose a significant safety risk to fishermen.