

OIL & GAS

Considerations during design to later benefit the environment during decommissioning

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Current environmental issues encountered in decommissioning

Legacy impacts of items left *in situ*

- **Gravity based structures GBS:**

- Very large! ~200,000t concrete
- Old GBS not designed for removal
- Can impede fishermen/snag risk
- Can impede shipping if GBS legs not cut -55m
- Can impact marine environment as they degrade and change local habitat (attract hard bottom species), and disturb seabed
- GBS Cell Contents: store oil (~100,000t), may contain oil sludge/water that will be released to environment after GBS degrades: impact local environment



Current environmental issues encountered in decommissioning

Legacy impacts of items left *in situ* (contd.)

- **Jacket footings (jacket >10,000t)**

- Can impede fishermen/snag risk

- **Wells**

- Plugged and abandoned wells can weep and seep (corrosion, degradation)

- **Pipelines**

- Any pipelines left in situ can potentially impede fishermen/snag risk in future

- **Drill Cuttings**

- Oil based drilling mud was used during drilling to lubricate until banned 1990's
- Sits on seabed and can potentially leach oil to marine environment

NOTE:

If the above facilities are removed, they will still result in environmental impacts:
e.g. onshore nuisance, energy use and emissions, waste generation etc.

Current environmental issues encountered in decommissioning

Waste (e.g.):

- **Asbestos:** Old topsides can contain significant amounts
- **PCBs:** can be present on old topsides
- **NORM and mercury:** can precipitate as scale in process plant
- **Tri-butyl tin TBT paints:** can be present on old facilities
- **Steel:** recycle
- **Concrete:** try to re-use if market available (e.g. crush and road fill)

Which decommissioning issues would still occur in the future for an offshore facility designed/built 2015?

Legacy:

- **Gravity based structures GBS:**
 - Yes: e.g. Sakhalin (GBS storage capacity is beneficial in icy areas).
 - No: After 1999 designed to facilitate removal (OSPAR requirement)
- **Drill Cuttings (oil contaminated)**
 - No: oil based drilling mud was banned PARCOM 1992
- **Jacket footings**
 - Yes
- **Wells**
 - Modern P&A improves over time, but still risk of weeps and seeps
- **Pipelines**
 - Yes

Which decommissioning issues would still occur in the future for an offshore facility designed/built 2015?

Waste (e.g.):

- **Asbestos:** no longer permitted
- **PCBs:** no longer permitted
- **NORM and mercury:** derived from reservoir
- **Tri-butyl tin TBT paints:** no longer permitted
- **Concrete**
- **Disassembly of (e.g.) complex pipes/pipes-in-pipes/umbilicals can sometimes be difficult**

What can be done in 2015 design to minimise these future issues?

Legacy

■ **Gravity based structures GBS:**

- Design to facilitate removal (after 1999 this is a formal OSPAR requirement)

Many new facilities are now subsea developments instead of GBS/jacket– does this facilitate removal? (subsea mega-structures/processing plant)

■ **Jacket footings**

- Design to facilitate removing footings?
- Design footings to reduce snagging risks?

■ **Wells** – Are plugging techniques to prevent weeps and seeps effective enough?

■ **Pipelines** – are there additional things that can be done at design stage to reduce snagging risks?

Waste

■ **NORM and mercury:** can anything be done so it is less likely to precipitate?

■ **complex pipes:** can they be designed to facilitate disassembly at decom?

Thankyou!





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