Decommissioning and removal – technical challenges

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LOC Group has extensive decommissioning experience and has worked on some of the largest and most challenging removal projects in the North Sea, including the Frigg Cessation Project, which straddled the UK and Norwegian sectors.

Alan Clifton, Managing Director of LOC Norway and a senior construction engineer, gives guidance on the decommissioning and removal process.

- The requirements for decommissioning and removal differ between jurisdictions.
- Key phases of the work will almost certainly take place in a remote, challenging offshore environment which requires comprehensive risk management.
- A tailored approach to each project is the safest and best way forward.

There are many kinds of offshore installations that will eventually need to be decommissioned and removed from their current locations. The requirements for decommissioning and removal differ between jurisdictions. In the North Sea, for example, the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) states that everything must be removed, but this is evidently not the case in other parts of the world.

Six stages of decommissioning

Generally, there are six stages to a decommissioning and removal project:

1. acceptance of the field end of life by the relevant authorities;
2. removal;
3. transportation;
4. offloading;
5. break-up; and
6. disposal.

We look at some of these in more detail below.

More than a third of the removal budget is typically spent on the marine operations/subsea cutting element of the project. It is important to be aware that decommissioning can often be more expensive than the original installation operation.

Risk management

There are general known and unknown risks that must be factored into any decommissioning project.

- Key phases of the work will almost certainly take place in a remote, challenging offshore environment.
- Documentation may be unavailable or out of date, giving limited indication on paper of the state of the installation to be removed.
- The installation is likely to be 'old', very 'used' and contain some hazardous materials.
- The company responsible for the removal will be aiming to remove and dispose of the installation at the lowest cost possible.

When preparing for a project, given all the general risks and numerous platform-specific risks, it is crucial to involve existing platform personnel in the process. Nobody knows a platform better than its personnel, particularly when it comes to mapping hazardous materials. If possible, the company responsible should be persuaded to continue minimum maintenance of a platform, even once shut down, until decommissioning begins. This will ultimately make the process more efficient and less expensive, as will a proper platform structure survey/verification.

Removal

Removal of a platform can be done in a number of ways:

- modular method;
- simply reversing the installation process;
- cutting the platform into 'small' pieces;
- other innovative techniques.

There are different risks associated with each of these methods. The **modular method** should involve structural verification – if the integrity of the items being removed is inadequate, structural collapse can occur. If a **reverse installation** is undertaken, risks associated with stability, structural and buoyancy integrity must be mitigated. Dropped objects are a key concern using the '**piece small**' approach, while spiralling costs are an ever-present danger when using **innovative techniques**, such as retro-fitting ballast tanks to a jacket. However, with planning, the risks involved with all these techniques can be minimised.

Transportation

Transporting removed items from the field location to shore for break-up can be performed using a variety of methods including; cargo barges, crane vessels, wet towing and, using baskets/containers (on normal platform supply vessels). Potential risks to be avoided here include barge or removed object damage during back-loading to transport barges, loss of cargo during transit and negative effects on the fatigue life of removal equipment. Clear operational weather criteria and set-down guides combined with sea-fastening/securing will assist in mitigating the risks involved.

Offloading

Offloading after transport using cranes or self-propelled modular transporters should be properly supervised, taking into consideration the stresses induced in the removed structure and sea-fastenings by the voyage. Care taken during physically dismantling structures must be matched in the keeping of accounting and inventory records and the compilation of an environmental report. A close watch must be kept for unmapped hazardous substances, which continue to pose a serious risk to the environment and personnel long after a structure is ashore.

Conclusion

It is important to be aware that there are different risks associated with each stage of a decommissioning and removal project. Currently, the Det Norske Veritas (DNV)'s 'Recommended practice for marine operations during removal of offshore installations', DNV-RP-H102, is the only widespread guide in use. A tailored approach to each project is the safest and best way forward.