

PLATFORM REMOVAL OPERATIONS – CHANGING THE INSTALLATION MIND SET

We have all heard the phrase “Applying an installation attitude to decommissioning will lead to installation costs”. Less has been said on how to change attitudes that are so deeply engrained in the industry. At Global Maritime we believe that a good place to start is to establish a clear understanding of acceptable levels of risk and then manage the risks accordingly.

In this article we will share examples of some of the opportunities and challenges that we have experienced when applying a decommissioning mind set.

Defining an acceptable level of risk for decommissioning

Some risks associated with marine operations are sacrosanct: the attitude to safety and protecting the environment do not change, irrespective of whether the operation is installing or removing an offshore facility.

However, with the exception of safety and the environment, decommissioning projects will generally have a different level of acceptable risk in comparison with installation projects.

Defining the attitude to removal risks for a decommissioning project should be carried out as early as possible with collaboration between operator, removal contractor and any third party assurance provider. Once defined it should be captured in the basis of design for removal engineering to ensure that it is consistently applied throughout the project.



Defining the right level of risk can reduce expensive reinforcement work offshore

When performing the engineering and planning for removal operations it is vital to continually challenge the standard paradigms.

By taking this approach it is often possible to remove excessive conservatism, the benefits are often real in terms of reducing the scope of expensive preparation work offshore and even reducing the scale of lifting equipment.

Does it matter if things go wrong? It's just scrap...

A significant and perhaps obvious difference between installation projects and decommissioning projects is that at the end of a decommissioning project the removed “asset” has a very low value compared to an installed platform. In many cases the removed structures are considered as scrap.



Removed structures have low value and earning potential

One of the few decommissioning specific guidelines for removal operations is DNV's Recommended Practice H102, titled Marine Operations During Removal Of Offshore Installations. This document allows a reduction in the acceptance criteria for structural assessments providing the structural members being considered are not critical for the integrity of the removal operation.

In practical terms this means that it is possible to apply higher loading to a structure before it needs to be reinforced. This is an important benefit in the context of some of the risks associated with decommissioning that are described later in this article.

The low financial value of the removed structures also has implications on the approach to insurance. Standard Construction All Risks (CAR) policies, often used as a basis for Decommissioning All Risks (DAR) policies, are based on the value of the asset insured. For decommissioning projects the value of the asset is low but the potential claim if the removal operation goes wrong could be high. This requires a different approach to insurance, again we recommend early engagement with insurance providers to ensure they understand the risks to be insured and so they have the opportunity to provide input as plans develop.

Vessel and removal contractor selection

Installation projects are normally sufficiently funded to almost eliminate risks at any cost. This luxury, as attractive as it may sound, is not economically viable for decommissioning projects.

The challenge of reducing costs in decommissioning projects creates opportunities for new operators and new vessel types to enter the market. For example in shallow waters, if there is little or no cost of delay in a removal operation, then a spread moored sheer leg crane may be more appropriate than a sophisticated and expensive DP crane vessel. In some cases the operators of these vessels may not have an extensive track record of working on offshore oil and gas projects but in our experience this can often bring a new perspective on acceptable risks, which can lead to more fit for purpose and cost effective solutions.

Operating beyond the elastic limit

Deformation of structures beyond their elastic limit is not usually allowed during installation. The newly installed facilities are at the start of their operational lives and permanent deformation is normally not desirable at this stage.

For decommissioning projects permanent or plastic deformation may be acceptable providing it can be shown that the remaining, or residual, strength is sufficient for the removal operation. In many cases it is possible to simply remove the affected structural members from the analysis model so that they have a zero contribution to the strength of the analysed structure.

In other more critical areas where localised plastic deformation occurs it is possible to use non-linear analysis and 3D finite element models to determine the extent of plasticisation and residual strength of the affected members. This is an advanced and sometimes time consuming calculation but the costs of performing the analysis can be easily offset if expensive structural reinforcements can be avoided.

Understanding the risks

Developing a decommissioning mind set is not always about relaxing standards. It must be recognised that there are some unique risks with decommissioning projects. These are commonly linked to uncertainties

associated with structures that may not have been designed or maintained for decommissioning.

The most common removal risks that are heightened for decommissioning are generated by the inherent uncertainties over weight, centre of gravity and structural integrity of platforms that are close to the end of their design life.

Typically these risks are addressed by adding contingencies to the engineering to compensate for the uncertainty. It is our experience that the cumulative effect of these contingencies can have a significant impact on removal operations including: necessitating structural reinforcements to lifted structures, and increasing the size of rigging components, they could even lead to the need to change the marine spread, which could result in a step change in project costs. Clearly it is important to be sensible about applying contingency factors. It is often possible to refine applicable contingency factors if the areas of uncertainty can be better understood.

A means of reducing uncertainty is to perform surveys, these can give valuable information on accuracy of weight data, extent and type of marine growth, corrosion and structural integrity.



Taking a closer look at marine growth

Understanding the intent of industry requirements and guidelines

To date the decommissioning industry has not been particularly active in defining industry specific guidelines for removal operations. In the absence of specific guidelines it is common to apply what is available, which generally means applying requirements that were developed for installation projects. In effect we find that this approach often takes the requirements out of their intended context.

This can be more clearly understood if we compare the typical process for installation and removal projects.

Installation process:

1. Loadout from quay to barge (sheltered)
2. Seafasten load (sheltered with yard facilities)
3. Transport from quay to field (in separate weather window from loadout)
4. Lift off from barge (offshore)
5. Lowering into place on seabed or jacket (offshore)

Removal process:

1. Lift off from jacket or seabed (offshore)
2. Backload on to barge (offshore)
3. Seafasten (offshore)
4. Transport from field to quay (in same weather window as removal)
5. Lift off from barge (sheltered)
6. Backload onto quay (sheltered)

What can be seen from this description of the processes is that the operations that typically take place in sheltered waters for installation projects are being performed offshore for decommissioning projects.

To give an example; with installation projects it is common to weigh structures such as modules prior to loadout. Also when a module is lifted off the quay in a sheltered location there may be the opportunity to make adjustments to crane hook heights to alleviate excessive tilt angles.

On the other hand with removal projects the first time the weight and centre of gravity is known with any certainty will be when the removal lift is made. There is no opportunity to weigh the item and replace it or to make adjustments to rigging. Once a removal lift is started the lifted load must be immediately lifted clear of the remaining structure to avoid re-contact.

Clearly a set of requirements or rules that are based on the assumption that there will be an opportunity to weigh loads, and to adjust hook heights as the load is taken, will need careful consideration of the intent before it is applied to the decommissioning context.



Lift engineering must take proper account of the decommissioning context

Management of decommissioning risks

An integral part of risk management for decommissioning projects is ensuring that there is an appropriate level of assurance. Typically this is offered in the form of Marine Warranty Surveyor services. If pitched at the right level an assurance provider can bring an objective third party view to the development of decommissioning plans, designs, procedures and during implementation of operations.

The positive effects of a third party review on decommissioning engineering and the level of rigour this introduces is recognised in industry recommended practices, in some cases allowing a reduction in load factors if compliance with their requirements is confirmed by a third party.

This positive view of assurance is also reflected in the feedback that Global Maritime receives from our decommissioning clients. It is clear that they value our assurance services in terms of the trusted provision of assistance with managing risks, the collaborative working approach and the technical expertise that is brought to the table. We believe these characteristics embody what is required to work with a decommissioning mind set.

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