7th April 2021 – Q&A Transcript

Third presentation in our Life Cycle of a North Sea Decommissioning Project webinar series.

Allseas: Making Single Lift Possible

Presenter: Michael Jeffery, Lead Engineer (Ninian North Topsides Removal), Allseas

Allseas is known for her flagship vessel the Pioneering Spirit and her single lift technology, the Topsides Lift System (TLS).

This talk will present CNRI's Ninian Northern Platform topsides removal project as a case study concentrating on the work that goes on in the background that makes single lift possible.

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Full Q & A Transcript (Webinar & Subsequent Offline Questions)

No.	Question	Answer
1	Could you please expand on the process taken to decide which platform elements require reinforcement before removal? Is this a function of enabling the cutted element to support a 100yr wave?	**Answered during webinar:** The first step is to analysis the topside for the specific conditions that the topsides will experience after separation of the legs; namely the in-situ post-cut, transport and load-in conditions. Then we assess each local detail that we are going to change and make an assessment to see if that location would require installation of any supports or reinforcement. This depends greatly on the project specific method for lifting and separation and also applies to any braces, caissons or secondary steelwork left in place for transport. We specifically analyse any condition that differs or will be changed from the original design and anything that is going to be affected during the lift. The aim is to minimise as much as possible the amount of offshore work.

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2	Is there more usage of drones/ ROVs to get a better understanding of the as-built platform? And is there a cost saving from this? Especially for much older platforms where sufficient drawings are not available	**Answered after the webinar:** For the topsides, visual survey is a key initial means of evaluating the topsides condition. Many areas are easily accessible but for those areas that can't be reached via walkways, rope access or drones can be the best solutions to complete a survey. There are some exciting developments being made in 3D platform surveys by some service providers enabling the capture of perspectives and details that would be otherwise impossible to get from walking around the platform. And all this can be done remotely, eliminating the need for a person to be exposed to working at height risks. Drone footage is nice to have but potential benefits needs to be balanced against the cost of the investment or service. The cost of a missed detail during engineering preparation can come back as multiple hours of lost offshore (vessel) time later and increased risk during execution. ROVs are an essential tool for subsea jacket preparation, both for visual inspection and intervention activities such as cleaning, flooded member detection and operation of subsea cutting tools. I can only see their use increasing in this field in the future. Despite their considerable cost, they are an invaluable asset to any subsea operation.

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3	When doing the castellation cuts do you place wedges or spacers to stop the castellation closing up during the cut ? None shown on the photos	**Answered after the webinar:** No, we did not install wedges for this project. I'm sure there are valid arguments for installation of wedges/shims for other cutting activities, however for this project we were able to accurately predict how the cut would close. We were able to demonstrate this to the client and MWS to their satisfaction. For the oxy-fuel cut legs, we achieved this by performing staged cuts allowing each leg to settle on itself through the cutting process. We started by cutting the horizontal sections of the castellation. When you cut steel with oxy-fuel you make a gap (or kerf) of ~5mm. In our case, the legs were capable of supporting themselves on the vertical sections of the castellation alone. Once a certain number of vertical cuts had been made the leg load exceeded the remaining materials capacity at which point the vertical sections were allowed to yield in shear until the 5mm gap had closed. We were carful to check for cut confirmation at each stage of the cut so we were sure that the cut was complete. For the diamond wire cut legs, we were able to make a similar engineered justification as to why wedges were not required. In a similar way, the leg was allowed to settle on itself throughout the cut, creating a tear drop shaped cut line profile trailing behind the wire location. This whole process was taken slowly and under control, only cutting one leg at a time. On a personal note, this was a very interesting scope to engineer and witness from the platform.

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4	Why was the cut operation performed 1year before the 'lift', seems quite a long time, especially over a winter period introducing risk. What would be considered the norm.	**Answered during webinar:** The concept of single lift removal has been around for the past 5 years so there is not one 'normal' timeframe between separation and lift. In contrast to this project, there have been projects that are cut only one month in advance. These would be engineered for a 10 year return period environmental condition (as opposed to the 100 year condition used for engineering the Ninian project). When the lift is performed is primarily driven by the client's acceptance and our vessel schedule. Whether the lift be one month or one year in advance, the risk of a catastrophic collapse is equally mitigated by the engineering checks done. The general rule is that the longer the wait (i.e. increased probability of seeing a large wave) the bigger the design wave used to check integrity and stability. The relationship is proportional so the overall risk does not increase.

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Society for Underwater Technology

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5	What is minimum water depth for offloading to shore, is this the main constraint or is it a real estate i.e. space constraint.	**Answered after the webinar:** For this project, the barge draft at the quayside was 8.1 meters with a water depth of approximately 12 meters. Any disposal quayside will require a reasonably deep water depth of a similar magnitude to receive the *Iron lady*. The maximum draft of the *Pioneering Spirit* is 27 meters, so transfers from *Pioneering Spirit* to *Iron Lady* often occur outside of harbour limits in deeper water. A deep water finger pier that could receive *Pioneering* Spirit directly would be an ideal facility for us but unfortunately there are not too many locations worldwide with up to 30m water depth possible at the quay.

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6	How much of the platform can be recycled?	**Answered after the webinar:** Disposal contractors aim for higher than 90% material recycled. The process starts with a so called 'soft strip' where the majority of chemical, soft materials, furniture etc. are removed. Any functional hardware that the client doesn't choose to retain is salvaged and the remaining steel structure is typically pulled apart with heavy machinery for scrap.

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7	do you foresee much reuse of topsides in early decommissioning projects?	**Answered after the webinar:** Yes, Allseas are currently working on a topside removal project where the contract has an option for reuse by re-installing of the topside on another jacket. This project team had to evaluate methods for cutting the topside in a way that would allow for transportation and re-installation.

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8	What is the operational water depth limit for the Pioneering Spirit?	**Answered after the webinar:** For the TLS, water depth is not a limiting factor for topsides removals. For the JLS, lift height is in excess of 100 meters above the water line. Deeper water jackets could still be removed in two parts or left as a degradation case if they would exceed this lifting height limit.

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9	Is there many platforms outwith the lifting capability of the pioneering spirit, or are the majority within?	**Answered after the webinar:** The TLS has a lifting capacity of up to 48000t which only limits us from removing the very heaviest of offshore platforms. The vast majority of topsides are within this limit. The interesting projects are those where not the total weight but the width or structural integrity of the topsides create the greatest challenge for removal. Similarly, the JLS will be able to remove up to 20000t in a single lift which covers the majority of jacket structures. The system has a capacity to lift 100 meters above the water but the other limitation is usually the structural capacity due to the heavy corrosion, or additional weight from trapped water or excessive marine growth which are factors that were not designed for when originally installed.

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10	in terms of the analysis and timelines for completing the lift analysis, what is the timeline accounted for in the "planning" phase?	**Answered after the webinar:** Lift and transport analysis normally takes a month to carry out. This includes weight and CoG variation analysis, assessment of all modules and the basic design of the lift points. We have models for generating dynamic fast lift factors which we apply to the structure model to tell us how much stress will be on the topside during the lift and we with every project we are getting this down to a reasonably fast process. We are continually improving and this area is actively being looked at to automate the process as much as possible. This phase depends greatly on the complexity of the topsides being assessed.