

Broad Bay Transocean Load Site ROV footage: Review of Anchor Leg Impact on Seabed and at Load-out location (OHT Hawk)

Reviewers: [REDACTED]

Marine Scotland

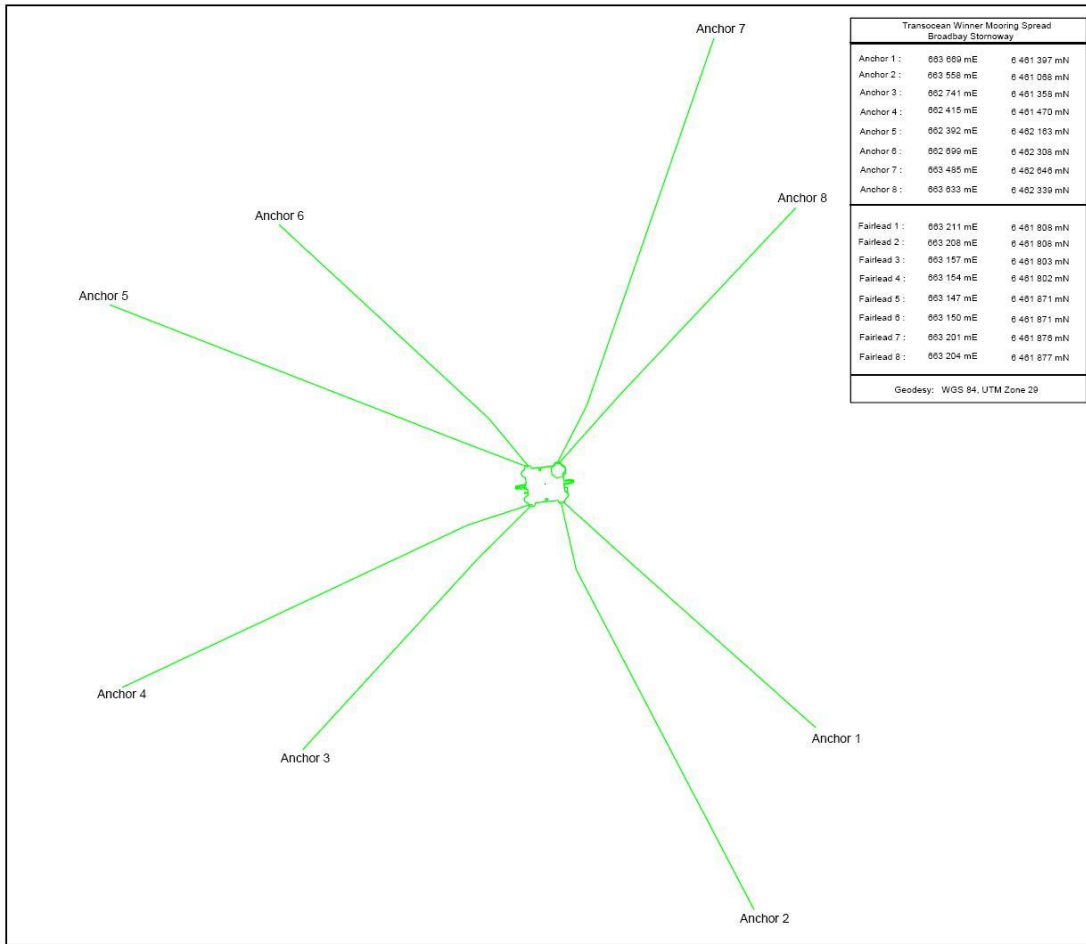
24th October 2016

Background

The Transocean Winner was stationed in Broad Bay near Stornoway on the Isle of Lewis from the 24th of August and the 14th of October 2016. Following the Transocean Winner's removal from the anchored position, a visual inspection of the seabed, by ROV, was conducted to assess the environmental impact to the locations where anchors and their chains were recovered from the seafloor. Following the departure of the OHT Hawk, with the Transocean Winner loaded, a similar survey of the seabed was conducted underneath the load-out location.

The ROV support vessel, the Polar King, was positioned directly above the anchor locations where a positional fix was taken using the onboard navigation system prior to the survey. The ROV flew directly over the marked position of the recovered anchor chain, running from the anchor fix point to the TDP fix using a combination of the chain pattern on the seafloor and following the navigation line displayed on the screen. This was repeated for each anchor line starting at anchor number 1.

Marine Scotland assessed the environmental impact related to each of the anchor legs. We looked for evidence of debris left behind, type of scarring, substrate type and species present at approximately 1 minute intervals on the video footage. We also recorded time, location, depth and heading. This approach was followed for the load-out location survey review.



Screenshot of the navigation grid showing the anchor pattern that the ROV surveyed along with corresponding locations.

Site (anchor-spread location)

The seabed is predominantly flat and composed of a mosaic of substrate types including coarse sand, sand with shells, gravelly sand, small cobbles and occasional boulders. Species list across the whole site consist of the following assemblages of:

Echinoderms	Molluscs	Crustaceans	Cnidaria	Fish
<i>Echinus esculentus</i>	<i>Pecten maximus</i>	<i>Cancer pagurus</i>	<i>Metridium senile</i>	<i>Clupea harengus</i>
<i>Asterias rubens</i>	<i>Octopus vulgaris</i>	<i>Pagurus pagurus</i>		
<i>Luidia ciliaris</i>		<i>Liocarcinus depurator</i>		

Anchor Legs/Lays

The individual anchor legs were observed to cause significant disturbance to the seabed. The removal process has left a deep trough along the seabed with steep berms. The impact is concentrated at the actual pull out area immediately associated with each anchor.

In certain places the anchor chain has cut through the sand to reveal a gravelly substrate underneath. There is significant anchor scarring relative to the site as a whole.

It is very difficult to give exact dimensions for these individual anchor pull out areas. However by observing the altitude indicator on the ROV heads up display and sounder, some of the troughs are at least 1.5 m to 2 m deep and have berms of approximately 0.5 to 1 m in the immediate area of the pull out. The individual anchor pull out areas vary in length and breadth but scarring diminishes gradually towards the ship end and centre of the anchor spread.

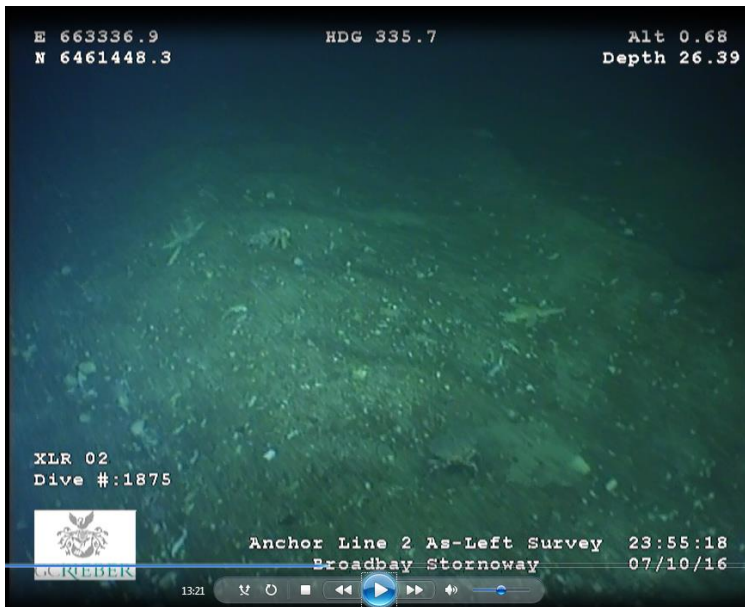
The anchor scars were rich in echinoderms and crustaceans. They appear to concentrate in large numbers along the scar, presumably due to the disturbance caused.



Anchor line 1, ROV part 2. Anchor scar on sand



Anchor line 1 part 1. Trough related to anchor scarring



Anchor line 2 part 2. Trough and horizontal striations perpendicular to trough on gravelly sand. *Asturias rubens* and *Cancer pagurus* attracted to the disturbance.



Anchor line 2 part 2. Trough caused by anchor on a rippled sandy seabed.

Consideration of remedial action to reduce anchor berms and fill anchor pull out areas.

It can be clearly observed that there has been impact on the seabed due to removal of the 8 leg anchor spread and specifically at the anchor pull out areas.

If this area were regularly fished with mobile gear, then deployment of a chain mat campaign should be specifically targeted at the anchor pull out areas only.

In our opinion creels will not be affected by the impact of the anchor leg spread. There may be a perceived risk to mobile fishing gear by the presence of the seabed impact specifically at each of the 8 anchor pull out sites.

Debris observed / removed on the anchor survey

In a previous survey (Load Location As-Left Survey), an ROV recorded debris found on the survey. We are satisfied that they removed all of this debris using a mechanical arm on the ROV itself. Types of debris included an anode, cloth or rag, a cable tie, welding rods, plastic straps, a steel plate, rubber matting, a plastic tarp, a plastic seal, a wire rod, a tin can and a metal plate.

On this survey of the anchor lines we observed minimal bits of debris left behind. Indeed, it is not clear whether these were all related to the Transocean Winner. Some had considerable marine growth on them so were perhaps dropped by other means and not attributed to the Transocean Winner. The debris includes a large grey stone-like object on anchor line 1 part 2, a semi decomposed barrel-shaped object on anchor line 2 part 1, a single cable tie and a large round object with considerable marine growth on it from anchor line 3 part 1, and lastly another unidentified round object near the start of anchor line 4 part 1. On anchor legs 4 to 8

only one small piece of debris was observed and this was removed during the ROV survey.

Survey review at load-out location

Following the review of ROV survey footage at the load-out location it was concluded that there was no debris observed that could be attributed to the load-out operations and there was no observed mechanical impact.

Conclusion

In a previous survey of the anchor-spread location, debris was observed and recorded (conducted by SNH). Following our review, we are satisfied that all of the debris associated with the operations have since been removed from the anchor spread area.

There were mechanical impacts observed associated with all of the anchor lays and chains. These impacts are not considered to be significant with respect to the use of static gear for fishing i.e. creel fishing. However, if the area were being fished with mobile gear, consideration should be given to remedial works specifically at the anchor "pull-out" locations. Note - Our understanding is that the area is currently closed to mobile fisheries.

At the load-out location, no debris, or significant impacts were observed following the departure of the OHT Hawk.

In summary, and based on the review of ROV footage, at the anchor spread area and the load-out location I / we have no further concerns, or requests for further action.