

## CASE HISTORY: “PORECHYE – EMPTY TANKS” APPLICATION OF “HOT TAP” TECHNIQUE

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This may seem to be a strange title, but read on and all will become clear.

January started quietly, unlike last year, when the “Braer”<sup>1</sup> sent us into overdrive. On Tuesday a telephone call from Tyne Dock Engineering, South Shields, put the team into gear again. The klondyker<sup>2</sup> “Porechye” had hit the rocks and damaged her hull and portside fuel tanks. At this time she was lying off the mouth of the Tyne and traces of oil from damaged tanks were observed. A survey by divers was carried out to estimate the amount of oil being lost and the extent of the damage



*Picture: Porechye before going into dry dock*

We arrived at Tyne Dock in the early hours of Friday morning and, after finding the drydock, we tried to get some rest before the meeting with the dock manager at 8 a.m. At approximately 0600 hours the “Porechye” was turned by tugs to enter the drydock. This is a very large vessel to enter this dock and only had an estimated 200 mm.

either side to clear the dock gates.

Unfortunately (or, in retrospect, fortunately) the wind was too strong and the tug could not hold her in position so the docking operation was aborted.

At the 8 o'clock meeting we were informed that the vessel had sustained damage to a possible five fuel tanks but no more oil was being lost. A fresh attempt would be made to dock her on the next tide.

The aborted docking proved to be a blessing in disguise because it gave the Alba team a chance to speak to the skipper, chief engineer and second engineer. The information from the ship's engineer was that the tanks were empty.

To leave the “Porechye” for a moment: this is the third time we have been called out to dry docks in Newcastle. The previous times only after the vessel had been docked and the oil had leaked out of the vessel into the bottom of the dock.

Although our clean-up operations were carried out with a speed and professionalism that we are known for (and proud of although we are modest as well) the team expressed concern that they were mobilised after the oil had been allowed to spill, and that so far the docks concerned had been lucky in that the amount of oil in the vessels' tanks had been relatively small (up to some 50 tons). It was suggested that it would be prudent to call Alba prior to the docking of the vessel if another similar occasion should present itself.

This time the dock manager did just that and we were there before they put the “Porechye” in dock or, should I say, before they tried to do so. Anyway, now you have got the background to this article, let's get back to the skipper and the engineers.

Arriving before the ship is docked allows the Alba team to use more than just its clean-up experience. It allows us to try to prevent spillage or, at least, to minimise it.

After the engineers explained how they identified the damaged tanks and that these tanks had been empty prior to the collision, a meeting between the dock manager, the skipper, the chief and the Alba engineers was arranged.

Alba's project engineer put forward that, although these tanks were verified empty by the ship's engineers, it might only be because:

- 1) They had lost suction on their transfer pumps prior to the grounding and
- 2) After the grounding they only drew water

In the team's opinion this did not mean that there was no oil in the tanks but merely that the ship could not transfer any oil and that the only way to be sure that the tanks are empty would be to hot-tap<sup>3</sup> the tops of the tanks and draw off whatever was there.

*Picture: Hot-tapping – The only available access route via manifold*

As we all know fuel oil floats on water and so by hot-tapping the tops of the tanks they can either be confirmed empty as water will be at the top of the tank, or, if oil is found, it can be removed.

Although this sounds quite simple, unfortunately it is not. Tank tops are not always where you can get to them and, on this occasion, one of the tanks fell into this category. The tank in question lay under another tank which still contained an estimated 300 tons of fuel.

At this time, the Alba team had successfully recovered fuel from four out of five damaged tanks which were now empty of fuel. The fuel from these tanks had been transferred via pumps and hoses to other tanks on board and there was nowhere left onboard to transfer the 300 tons from the top tank.

The skipper and dock manager were reluctant to offload the top tank because of the expense and so the team had to find another way to access the lower tank.

The only available access route was via a tank overflow manifold, located in the forward air conditioning machinery room. This was achieved and over the next 12 hours marine fuel oil (MFO) was removed at a steady rate and transferred around the ship. In total 140 tons of MFO was transferred from **"the empty tanks"**.

Doubt existed as to whether all the trapped oil in the lower forward tank had been removed although pumping was continued until only water was encountered.



*Picture: Deployment of boom to contain possible spill*

With the damaged tanks giving no buoyancy and all the fuel now in the starboard and stern tanks, the ship's trim was wrong for it to safely enter the drydock and so approximately 160 tons was offloaded, this being the maximum quantity that could be accommodated in the only barge immediately available.

With delays caused by high winds, a blown power cable and now the need to correct the ship's trim, The dock had missed the high water window and the ship could not be

docked for another 8 days.

Because of the need to hold the ship in berth to await the next docking opportunity the Tyne Harbourmaster required that a precautionary containment boom be deployed around the vessel.

It was decided to use 200 m. of Bay Ro-Boom and this proved to be ideal for the purpose. The deployment complete, the team headed back to Aberdeen, leaving one man to attend the boom.

### **Porechye – The Sequel**

On Monday 31<sup>st</sup> January the Alba team returned to Newcastle for the conclusion of the "Porechye" saga.

The ship was to be docked at 1800 hrs. on Tuesday and the team was back on board the vessel. Four of the damaged tanks were checked again and were confirmed clear of any significant quantity of oil. We were still unhappy about the fifth tank but with 300 tons of fuel in the tank immediately on top of it and no possibility of verifying oil content, there was nothing we could do but hope that the original information given was correct. All would be revealed when the ship was finally docked and the water level dropped.

Our worst fears were confirmed when, as the water level dropped, oil appeared on the surface, black heavy oil and much more than just minor residues left in the four tanks we could access and empty.

The clean-up started as soon as the level had dropped enough for us to get the equipment into operation and continued until all the oil had been collected. A total of some 35 to 40 tons was recovered from the dock; a messy and time consuming job but achieved without any leakage of oil from the dry dock into the river.

If the total quantity of oil in the damaged tanks, something in excess of 170 tons, had dropped out a serious pollution incident would have been inevitable. The dock gates were of a type designed to keep water out rather than in and, as the tide dropped it would have been impossible to prevent the loss from the dock of such a large quantity of oil. The exercise of recovering the greater part of the oil from the damaged tanks had undoubtedly achieved the objective of preventing a major pollution incident.

In retrospect, a decision to remove the 300 tons of oil from the upper forward tank to permit good access to the lower tank could have prevented any significant loss of oil in the dry dock but this was not an option at the time.

After the recovery was completed there was still the boom to recover and the equipment to be loaded. This completed, the team headed north again.

There are lessons to be learned from the "Porechye" –

- 1. Tanks are only empty of oil when proved to be so.**
- 2. All tanks should be checked.**
- 3. More time is needed prior to dry docking**

35 tons makes one hell of a mess in a dock bottom. Imagine what 170 + tons would have done – especially in a situation where the dock gate design allows water egress to a river on a falling tide.

<sup>1</sup> *The Norwegian tanker Braer ran aground off the Shetland Isles on 5 January, 1993, spilling almost 85,000 tonnes of crude oil.*

<sup>2</sup> *Klondyker – An East European fisheries factory ship, called this after the gold miners who took part in the 19th-century gold rush to the Klondike*

<sup>3</sup> *Hot-tapping – A technique used to cut a hole in a pressurised tank, without any loss of product, allowing contents to be drawn off in a safe manner via a valve. In this case, an air-operated hot-tap machine was used, designed by Alba International Technical Director, Robert McWhinnie B.E.M. and built in-house at the company's workshop in Aberdeen.*