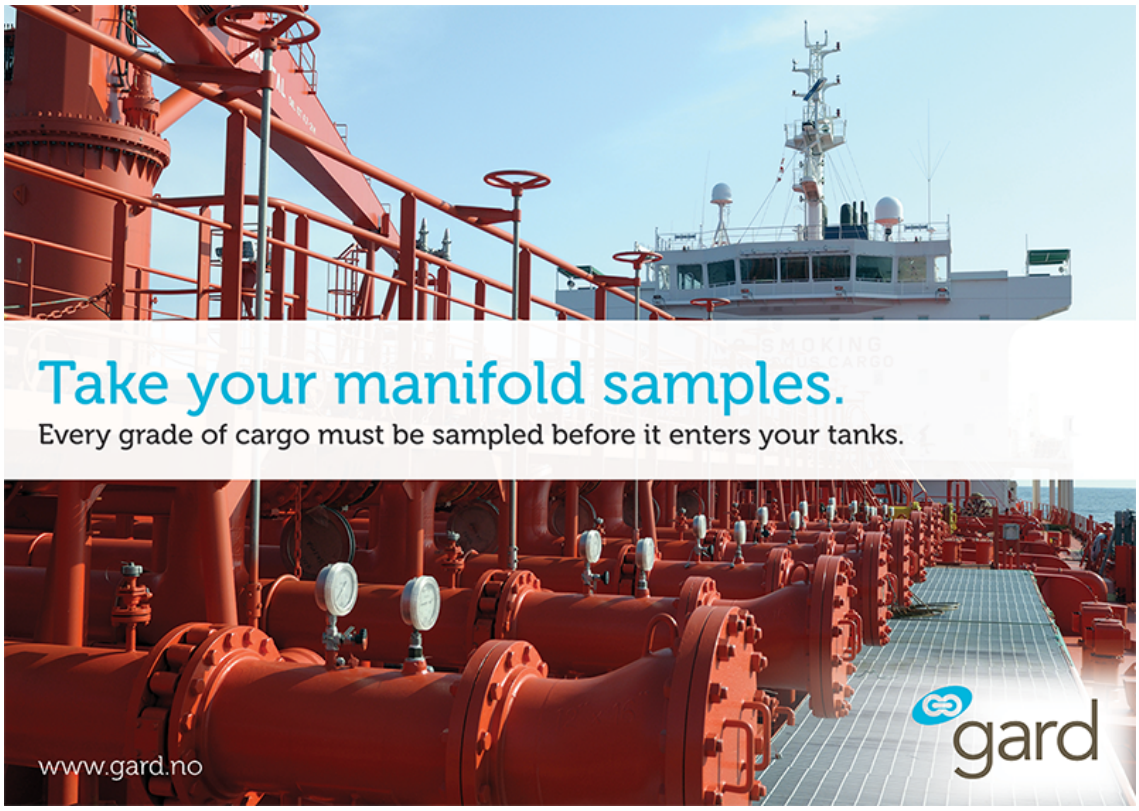

Liquid cargo sampling

A pro-active approach to cargo sampling on tankers can potentially save millions of dollars in claims and prevent delays to the vessel. In this Insight we look at some critical aspects of cargo sampling on tankers.

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Disputes relating to “off-spec” or contaminated liquid cargoes are a recurring problem and shipowners may have no independent evidence as to the cause of an alleged cargo contamination. The source of the problem could be in the shore tank at the load port, in the shore pipeline during loading or on board the vessel itself. The cargo could even have been manufactured out of specification prior to delivery to the terminal for shipment. However, if the cargo is found to be “off-spec” when the vessel arrives at the discharge port and there is no evidence of contamination from the load port, the vessel could be faced with a claim, even if the vessel is not at fault.

Samples drawn at the load port and retained on board showing that the condition of the cargo has not changed between loading and discharge provide the best defence against cargo claims. It is therefore important that shipowners and operators implement proper procedures for taking, and retaining, own (duplicate) samples of all cargoes loaded on the vessel and train their crew in how to perform the sampling process. An experienced officer may be able to identify a poor-quality sample by visual inspection alone, and early intervention may prevent an expensive claim arising later.

Case Study

Although substantial resources are used on board vessels in the preparation and cleaning of tanks and lines prior to loading, we see that samples are frequently not taken by the vessel at the start of loading. Alternatively, where samples are taken, they are not taken following the proper procedure or are discarded for one reason or another before they can be analysed.

In a recent Gard case, a chemical carrier arrived at a terminal with its cargo tanks and lines cleaned and ready for loading. The vessel was inspected upon arrival and found to be suitable for the nominated cargo. No manifold samples were taken at the commencement of loading, but first foot samples were taken from the designated tanks that were being loaded. Upon analysis of the first foot samples the cargo was found to be off-spec resulting in stoppages and delays on the vessel’s account for further tank cleaning. The vessel was held responsible for contaminating the cargo. The cargo in the vessel’s tank was pumped back ashore and the vessel was instructed to leave the terminal to clean her cargo tanks and lines.

The chemical tanker returned to the terminal following cleaning operations and loading was resumed. On this occasion, manifold samples were taken and analysed and everything found to be in order. However, upon detailed analysis of the sample of the contaminated cargo, the cause of the contamination was suspected to be from the remains of the previous cargo in the shore tanks and lines. Given that there were no manifold samples on the first occasion, there was no way for the vessel to prove that the cargo received on the first occasion may have been contaminated prior loading.

Protecting the vessel’s interests

Manifold samples

The transfer of custody of the cargo from another vessel or the terminal to the vessel, and vice versa, normally takes place when the cargo passes the vessel’s manifold. A manifold sample taken at the start of loading and discharge can, in principle,

determine who is responsible for the contamination of a cargo. It should be noted that manifold samples should be taken outboard of the manifold valve. During this process, the loading rate should be very low, preferably by gravity.

In some Gard cases, even where a manifold sample had been taken at the start of loading, samples have been known to have been disposed of by the crew if they do not appear to be of the expected quality. A new sample is then drawn once the cargo quality appears as expected, and becomes the manifold sample "on record" as having been taken by the ship at first loading. Thus, the only evidence available in this instance indicates that sound cargo was loaded and the evidence showing that the cargo had been contaminated ashore is lost. While this practice appears to be counterintuitive, it is nonetheless, prevalent.

First foot samples

First foot samples should be taken to confirm that the vessel's systems and pipes are clean. This is particularly important where sensitive and/or expensive cargoes are loaded to reduce the risks associated with contamination of the entire cargo parcel.

Tank samples

Taking a final tank sample after completion of loading and prior to commencement of discharge will enable the vessel to determine the cause of any potential contamination on board. It can also be useful for the officer in charge to request specimens of samples taken by the terminal's surveyor at the terminal's manifold as well as samples from the shore tank and shore line. If the quality of the cargo samples from the ship and shore appear to be different, loading should be ceased for further investigation.

Recommendations

To ensure the best possible defence of a cargo claim against the vessel, it is recommended that shipowners create awareness among the crew of the problems related to improper sampling and have in place written procedures describing the sampling process in detail. An improper sampling method can result in a poor-quality sample which is not necessarily representative of the cargo itself.

The procedures should include and emphasise the following points:

• *Involvement of vessels' crew.*
The crew should participate in the taking of cargo samples, both during loading and discharge, and should be competent in checking and verifying the quality of the samples taken. The Chief Officer should preferably be involved in all cargo sampling whether it is taking samples for the vessel or for the charterers.

• *Independent cargo samples to be taken by the vessels' crew.*
As a minimum, the crew should, for each grade of the cargo, take:
Manifold samples, taken at a vessel's manifold at the start of loading, preferably with the manifold valve in a closed position. Spot checks should be carried out at the manifold during loading whenever practicable, e.g. after shore stops and/or change of shore tanks.
Pump stack samples, if taken by a surveyor the vessel should take own/duplicate samples.
First foot samples, taken from the cargo tanks once cargo level reached the first foot in the tank(s).
Final tank samples, taken from the cargo tanks after completion of loading.
Cargo tank samples prior to commencement of discharge.

• *The importance of the manifold sample*
, often referred to as the 'million-dollar sample'. Where a proper sample of the first products loaded has been drawn and retained onboard, any uncertainty about the quality of the cargo at the time of loading can usually be clarified at relatively low cost. Vessel procedures should therefore be specifically formulated to avoid any misunderstandings when it comes to ensuring that this manifold sample is never disposed of, regardless of its apparent quality.

• *Handling of samples.*
Always flush the sampling point prior to drawing a sample.
Always use clean and appropriate sampling equipment and properly label, seal and store the samples in designated areas
The labelling should always state where, what type and when the sample was drawn, e.g. "manifold at commencement of loading" or "final tank sample drawn in the middle of cargo tank 4P".
Ensure there is sufficient sample amounts for retesting if necessary.
For sample retention, we recommend Members and clients have a clear policy taking into consideration the storage space, the vessel's schedule and the number of grades loaded for each voyage. Samples should be retained for at least three months after the completion of discharge. If the vessel has received complaints during a voyage the samples should be retained for longer if possible, or ask your insurer if the samples can be disposed of.
Recordings should be made in the cargo log-book to ensure traceability of samples taken.
Sample bottles should, as far as possible, be suitable for the cargo in question. For example, use amber coloured glass bottles for UV sensitive cargo to prevent deterioration due to the effects of UV lights.
For cargo that is oxygen sensitive the bottles should be purged with nitrogen prior to sampling.

• *Sample report*
: On completion of sampling, a sample report should be produced by the vessel listing the unique identifier number of each sample retained on board and of the samples given to the charterers' surveyor. The sample report should be jointly signed by the vessel's Master, or his representative, and the charterers' surveyor.

Shipowners and operators should instruct their officers on board that whenever they are in doubt as to the apparent quality of a liquid bulk cargo, they should seek expert advice and have any samples analysed at the loading port.

We also take the opportunity to remind Members and clients that Gard's posters addressing issues onboard tankers, " *Manifold samples* ", " *Contamination by cargo vapours* ", and " *Are your valves marked?* " are available for download at: Posters - Gard