

Global service
built around you

North

Liquid Cargo Sampling



CARGO

Liquid Cargo Sampling

CONTENTS

Introduction.....	01
Where and when to take samples.....	01
Looking at samples.....	02
Sampling method.....	02
Control of samples.....	02
Further guidance.....	04

Introduction

Sampling is a vitally important factor in the monitoring of the quality of liquid products during transfer and transportation. The acquisition and subsequent care and retention of representative samples is the most potent device available to ship's officers in the rebuttal of unfounded contamination claims.

This applies to petroleum products, crude cargoes, chemical cargoes, veg oil cargoes or other liquid products, where disputes concerning the quality of the cargo may lead to allegations of inappropriate cleaning, improper carriage or other forms of contamination during the voyage.

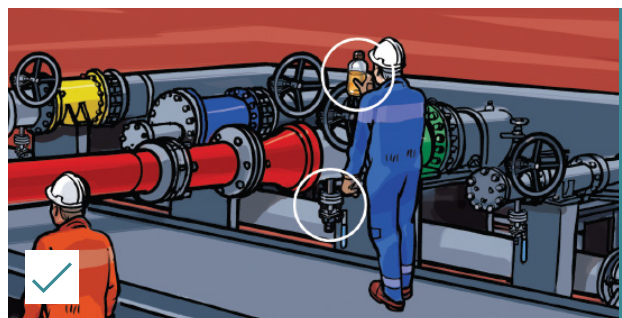
Masters should be aware that joint samples are not the only form of evidence accepted by courts, samples taken by the ship alone do have value as evidence. If a shipper or receiver refuses to carry out joint sampling, the ship can take its own samples and these can be used to protect the ship and owner.

Where and When to Take Samples

The list below outlines best practice for liquid cargo sampling. It is worth noting, however, that in certain circumstances it may not be possible to achieve the complete list. This does not mean that vessel should voluntarily opt out of using best practice to help protect the Member's interest.

- I. **Load port shore tanks** – In some cases the load port may not allow, or it may be impractical for, the vessel or surveyor to take samples from shore tanks prior to loading. In these circumstances it may be possible to receive a tank sample from the port.
- II. **Shoreline sample** – Taken from close to shore manifolds. Particularly important following any line flushing, packing or plugging operation completed by terminal.
- III. **Vessels manifold at the start of loading (first flow sample)** – At start of loading, it is strongly recommended that samples are drawn at the ship's manifold so that such samples can be compared with the first-foot samples subsequently drawn from the cargo spaces.

Samples should also be drawn from the manifold whenever some doubt exists as to the quality of the supplied or discharged product or after scheduled and unscheduled stoppages by shore. In any event, manifold samples should be taken at the start of loading or discharging of each grade.



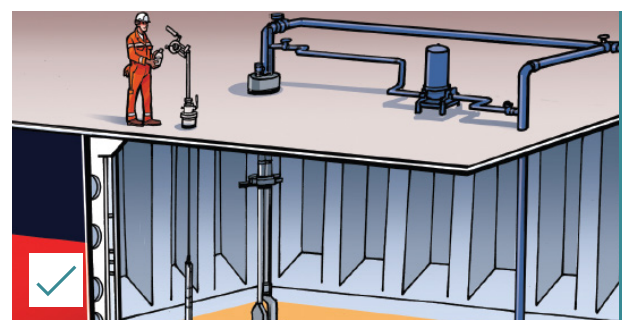
A similar sample should be drawn after any stoppage or change of shore tanks. It may also be considered good practice to take regular samples throughout the operation in order to ensure continual quality.

These samples should be examined carefully and if doubt exists as to the quality of the cargo being received then the responsible officer should stop loading and seek further guidance.

When sampling from an installed sample point, it is very important that this has been flushed of any previous residues prior to start of cargo operations and before obtaining a reference sample.

- IV. **First foot sample from vessel's cargo tanks** – In the case of petroleum products, it is the normal practice to test the cleanliness of ships' lines by taking "first-foot" samples. Loading should be stopped as a sample is drawn from the nominated tank(s) and taken ashore for key test analysis.

In cases where some doubt exists as to the quality of the first-foot sample, further samples should be taken for the ship's own reference purposes. It is obviously important to confirm the integrity of the line and tank system in use to ensure that any such quality doubt is not attributable to shipboard factors such as adjacent and different grade products.



In some instances, the inspector will draw first-foot samples while loading continues uninterrupted. These samples necessarily are subjected to only a very basic visual analysis, that is a lesser degree of quality control, and this practice should be discouraged if possible.

Liquid Cargo Sampling (cont.)

V. Running or composite sample post loading – A running sample is obtained by lowering an un-stoppered sample container from the top to bottom and returning to the top at uniform rate as to obtain around three-quarters filling of the sample container.

A composite sample is a blend of spot samples mixed in volumetric proportion in order to obtain a “representative” sample of the bulk. The method of sampling will depend on the type of cargo loaded.

VI. Pre-discharge sample – Similar to **V** above. This sample is useful evidence to show that no contamination has occurred during the voyage through passing valves or vapour contamination.

VII. Manifold sample at start of discharge operation – Samples should be drawn at the first flow of cargo from the ship’s manifold sampling points (similar to **III**). These samples provide useful evidence that the cargo was on-spec as it left the ship’s side. Like **III** above, these samples should be examined and if doubt exists as to the quality of the cargo being discharged then the responsible officer should stop discharge and seek further guidance.

North has seen examples where a cargo has been contaminated during the voyage and was discharged ashore into a number of partly filled shore tanks. The resulting mix of cargo resulted in the entire tanks’ contents, including the cargo already present, being declared off spec.

VIII. Shore tanks before discharge and at completion of discharge – Similar to **I** above, the shore facility may not allow, or it may be impractical, for a vessel or surveyor to take samples from shore tanks.

Looking at Samples

Because of the inability of the ship’s officers to undertake a full analysis of samples, only the most obvious contamination problems will be apparent at the outset. Such problems may manifest themselves as a change in colour or the presence of water or of a foreign particulate matter. Depending on the toxicity of the cargo the density and smell of the sample may also be tested as a means to identify faults with the cargo

In many cases, particularly in the case of high purity products (such as lubricating oil), the ship’s lines and pumps will be checked for cleanliness at the discharge port by slopping a small quantity into a reception container. During such slopping operations, a sample should be drawn at the manifold for reference and retention purposes.

It is worth repeating that it is very important that if the responsible officer is in any doubt as to the quality or type of cargo being loaded or discharged at any stage of the operation then the loading or discharge should be stopped until further analysis is completed.

Sampling Method

The method of sampling will vary according to the properties of the cargo being carried. Some cargo may require that air is excluded from a sample or the toxicity of the cargo may dictate that closed sampling should be followed.

When it is not possible to undertake closed sampling, open sampling may be required. This may involve the use of equipment passed into the tank via an ullage or sampling port, and personnel may therefore be exposed to concentrations of cargo vapour. As cargo compartments may be in a pressurised condition, the opening of ports or covers and controlled release of any pressure should only be undertaken by authorised personnel. When this procedure is followed, the tank openings should only be uncovered long enough to complete the operation.

When sampling, proper care must be taken to avoid inhaling gas. ISGOTT 11.8 recommends personnel should keep their heads well away from the issuing gas and stand at right angles to the direction of wind.

Appropriate personal gas meters should be worn by all persons involved in the sampling operation.

Sampling apparatus and associated equipment must be clean and suitable for the cargo being sampled. All sampling work should be carried out with clean hands and where protective clothing is required, clean items constructed of a suitable material should be used.

Any samples drawn for shipboard purposes should be noted in a separate sampling log. A list of samples drawn and retained by the ship should be prepared and handed to the shore representatives or independent inspectors for acknowledgement and signature.

It is important that the samples are drawn in compliance with industry practice as set out in publications such as those by the American Society for Testing and Materials (ASTM), the American Petroleum Institute (API), the Energy Institute (EP) or the International Organization for Standardization (ISO).

The most difficult aspect of sampling is obtaining a representative sample, particularly in the case of non-homogenous cargoes such as fuel oils which may be prone to stratification within the cargo tank.

Control of Samples

Sample Vessels

Samples should be initially taken using a non-coloured clean glass container and then, after inspection, transferred into an appropriate sample bottle for the type of cargo being loaded. Drawing the sample into a clear glass bottle allows the responsible officer to check the cargo sample for signs of sediment, free water, colour and if required density and smell (if non-toxic).

Liquid Cargo Sampling (cont.)

In the majority of cases a sample does not have to be greater than half a litre.

Samples should be stowed and secured to prevent damage from any movement of the vessel.

Samples should be stowed in a dark, well ventilated dedicated locker where daylight cannot enter and away from sources of heat, living quarters and provisions storerooms.

Sealing

The seal number would normally refer to those seals placed on a sample by an independent inspector. However, it is increasingly common for ships to be equipped with their own seals which are easily obtained and relatively inexpensive.

Sample Labels

Whenever possible, all samples drawn by the ship's crew, or on behalf of the ship by an attending surveyor, should be clearly labelled with the following information.

- Ship name.
- Operational status
 - Before discharge
 - After loading
 - Before loading.
- Product.
- Sample source
- Tank number
 - Manifold number
 - Pump number.
- Sample type
 - Top
 - Middle
 - Bottom
 - Dead-bottom
 - Running
 - Composite.
- Identity of sampler
 - Surveyor
 - Crew member.
- Date and time of sampling.
- Location
 - Port
 - Berth number
 - Anchorage.
- Seal number.

In some parts of the world the ship's crew may come under pressure to complete some sections of these labels prior to the sampling being conducted. It is important that the labels accurately reflect the information relevant to the sample drawn and on no account should the data be pre-populated prior to the sampling operation being carried out.

Sample retention



The safe-keeping of samples in a suitable locker is of paramount importance. Depending on the prevailing circumstances and company specific procedures, the samples should be retained for at least one year, by which time notification of any claim should have been made. It is recommended that samples are retained for more than this period if there was clearly a problem or doubt concerning the product quality during the voyage. In most cases, cargoes will be loaded and delivered without incident and, in these cases, disposal of samples is a matter of common sense based on the availability of storage space. Ideally the head office should be asked to confirm that sample disposal is in order as it will have notification of any claim arising.

Conversely, as soon as a claim is raised against the ship or the owner is notified of third party involvement in a claim, then the ship should be advised to identify all relevant samples and arrange for these to be landed at a suitable location, into the custody of an owner's (or P&I club's) representative.

If the master suspects there may be problems with the onwards transportation or local analysis of the samples then the P&I club should be consulted for further guidance.

No attempt should be made to disguise or ignore any observed comingling or mis-routeing of on-board cargoes, or any observed or possible contamination. In terms of cost effectiveness, early resolution of such problems is much the preferred approach and reduces the potential exposure to the owner and its P&I club.

Liquid Cargo Sampling (cont.)

Further Guidance

Further guidance and information may be found in North's loss prevention guide about Shipboard Petroleum Surveys and its Hot-Spot information sheet about Liquid Cargo Sampling which may be read at:

www.nepia.com/latest/publications/

Disclaimer

The purpose of this publication is to provide a source of information which is additional to that available to the maritime industry from regulatory, advisory, and consultative organisations. Whilst care is taken to ensure the accuracy of any information made available no warranty of accuracy is given and users of that information are to be responsible for satisfying themselves that the information is relevant and suitable for the purposes to which it is applied. In no circumstances whatsoever shall North be liable to any person whatsoever for any loss or damage whensoever or howsoever arising out of or in connection with the supply (including negligent supply) or use of information.

Unless the contrary is indicated, all articles are written with reference to English Law. However it should be noted that the content of this publication does not constitute legal advice and should not be construed as such. Members should contact North for specific advice on particular matters.

Published March 2014.