

Product carrier cargo loss control

Cargo contamination and delivery shortfalls occur far too often. Even more unfortunate is the fact that as soon as a problem is suspected, the blame is immediately put on the ship.*

Having studied hundreds of quality and quantity issues over the years, I would say that the ship is to blame only about 10% of the time. About 80% is caused by suppliers (or ‘sellers’) at the load port. The remaining 10% can be attributed to receivers (or ‘buyers’) at the discharge port, if they do indeed ever declare it. When receivers have caused the problem, suppliers and shipowners rarely hear about it, and any issue quickly disappears.

In order to achieve any shipment of oil, there are three basic stages -

- 1) The load port - cargo is loaded from shore tank(s) to ship’s tank(s).
- 2) The transport or transit - the cargo is transported from port A to port B in ship’s tanks.
- 3) The discharge port or ‘disport’ - the cargo is discharged from a ship’s tank(s) to shore tank(s).

Contamination or loss of the cargo can occur during any of these three stages.

In general terms, suppliers and receivers will jointly appoint at split cost (50/50) an inspection company (which delegates inspectors) to oversee the whole shipment, from shore tank to ship, to shore tank. The primary role of the inspection company is to monitor and record Q+Q (quality and quantity) and eventually produce the ‘certificate of quality’ and the ‘certificate of quantity,’ which becomes the ‘bill of lading’ figure (nobody ever talks about the ‘certificate of quantity,’ as it is overshadowed by the ‘bill of lading’). Inspectors must be present at both load and disport.

A note for the Master: the inspector has absolutely no contractual obligation or allegiance to the ship, which is why, when things turn sour, the inspector usually becomes uncooperative. Inspection companies are normally paid by their principals to supply their own calibrated and certified equipment (there are only two types, MMC or UTI). But inspectors are usually dependent on ships’ devices. The next time you get into a dispute with the inspector, issue a ‘notice of protest’, saying he/she is ‘using ship’s equipment for the purposes of quantity and sampling’. The inspector will soon go and

find his or her own, during which time he/she is causing a delay.

Below are the normal sequence of events:

- 1) Suppliers sell a cargo to receivers. Q+Q will be agreed. Quantity will simply be a number, for example 100,000 tonnes. Quality will be as per an agreed specification (spec) for that product. Q+Q is written in the contract between them, often referred to as ‘deal terms.’ One of either the supplier or receiver will usually be the charterer of the ship, depending on the deal terms.
That’s for the lawyers, but if interested look up ‘Incoterms’ (CIF, CFR and FOB are the most common). These terms define ‘risk and title’ at each stage, which is important for insurance. The greatest risk is when the ship is in transit or ‘afloat’ with the cargo, so it is important to know which party is exposed to that risk.
- 2) The charterer will give voyage orders to the Master defining, among many other things, the name of the cargo and quantity to be loaded (‘the nomination’). There may also be some details of the quality spec. In particular, the Master needs to know the density, so he can plan the stowage of the cargo, because for a fixed tonnage, volume varies with density.
- 3) For example, the Master receives voyage orders to load 20,000 tonnes, +/-5% of diesel (the same diesel you put in a car). The Master will consider how best to stow the cargo (into which tanks to load it). The Master of the ship will consider the compatibility of his last cargo, for example ‘motor spirit’ (more commonly known as petrol or gasoline), with the next and decide what tank cleaning will be needed, if any. No cleaning, or insufficient cleaning, can cause contamination between cargoes. The general advice for loading diesel after motor spirit is to wash all tanks with water (a salt water wash, then a fresh water rinse), then drain well. The Master will advise the charterer of his intended cleaning plan, and then proceed to clean. Occasionally the charterer may suggest cleaning

requirements. Ultimately, it is up to the Master to present his ship ‘fit and ready in every respect to load’ (this is a standard phrase and includes the cleanliness of tanks for the intended cargo, plus all the other logistical preparations for loading).

- 4) At some time prior to loading (often before the ship has arrived), the inspector will measure the quantity in the shore tank(s), and also take samples (sample set 1¹). Measurement and sampling should normally be done within 24 hours of the intended load operation. The samples are subjected to key tests in a laboratory, as a last minute check that the product in the shore tank is on spec. As long as the test results meet the minimum quality spec, then the custody transfer (loading) can commence. Shore tank samples (not necessarily those taken within 24 hours) normally form the basis of the certificate of quality.
- 5) The ship arrives at the load port ready to load the nominated cargo. The inspector will board and will :
 - a) Inspect all the ship’s tanks to determine their suitability to load the next cargo. Rarely will this entail physically entering the tank. It is normally done from deck level. If the ship’s tanks are inerted, then the suitability for loading the next cargo will be based on documents alone.
 - b) Dip all tanks to ascertain the amount of liquid remaining in the tanks from the last cargo. This is known as OBQ (on board quantity). On product tankers, OBQ should normally be zero.
- 6) Once everything is in order, the cargo is transferred from shore tank(s) to the ship’s tank(s).
- 7) After loading is complete, the inspector will :
 - a) Survey shore tanks to ascertain the amount that has been transferred from the shore tank. This can simply be the shore tank figure before, minus the shore tank figure after (figure 1²). This figure may also be a metered figure.
 - b) Survey the ship’s tanks to see how much has been received on board. This

is known as the ‘ship load port figure’ (figure 2³), and is simply the quantity after loading minus any OBQ. This figure is for reference only, and usually is needed only if a dispute arises.

- c) Normally produce a ‘certificate of quantity’ based on figure 1. This is the preferred figure for official figures, as it is usually very accurate. Occasionally the ‘certificate of quantity’ is based on figure 2, when shore figures are unreliable, or when loading in ports less technologically advanced. Figures 1 and 2 should theoretically be the same. Any difference is known as the ‘load port loss,’ and a difference of up to 0.1% is normally acceptable.
- d) Take samples from all the ship’s tanks (set 2⁴), usually three sets. One is for suppliers (2a), one is for receivers (2b), and one is for the Master (2c). Sets 2a and 2b will normally be transported by the ship and delivered to the inspector at the disport. Set 2c is retained on board indefinitely and is deemed the owner’s official set, irrespective of what others the crew may take.

8) As long as there is no issue of Q+Q, the ship sails, and steams to the disport. During transit the cargo must not be tampered with in any way, so the exact same cargo should be found in the exact same tanks on arrival in exactly the same condition, aside from any natural change in temperature that will cause a change in volume. The only exception to this is if the cargo needs to be heated, such as with fuel oils or vegetable oils, which will need the ship to apply heat.

9) Just before the ship arrives at the disport, the inspector will measure shore tank quantities and at the same time may take samples.

10) On arrival at the disport the appointed inspector will :

- a) Take samples from the ship’s tanks (set 3⁵). The inspector will then take receipt of sample sets 2a and 2b from the load port. It is imperative that the Master does not part with his set (2c), as this set will help to protect him in the event of a dispute. The inspector takes the three sets (set 2a, 2b and 3) away to the laboratory. Set 3 will normally be tested prior to the start of discharge to ensure

the quality has not changed somehow since loading. As long as the spec is met, they will test no more, and the ship will be ordered to discharge. If set 3 is off spec for whatever reason, then sets 2a and 2b will need to be tested for comparison. If this happens, delays will occur and a dispute will begin. By testing the samples at their various stages, one can usually identify at what stage the cargo became contaminated.

b) Determine the amount of cargo in the ship’s tanks, less the OBQ at load. This figure is known as the ‘ship’s arrival figure’ (figure 3⁶), and is compared with the ship’s load port figure (figure 2). Any difference is known as the ‘in-transit loss.’ An in-transit loss of up to 0.1% is acceptable.

- 11) As long as there are no issues with Q+Q, the discharge begins. Once discharge begins, the Master can be 99% sure that he has loaded and transported the cargo to the disport with no issue of Q+Q, otherwise he would not have been permitted to start.
- 12) Under the normal course of events, the ship is left unhindered to discharge all



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the cargo in one seamless operation. But sometimes cargo is started and stopped at the request of the receiving terminal.

- 13) At the end of the discharge the inspector will:
- Measures shore tank(s) to assess the amount of cargo that has been received ashore (figure 4⁷). This is known as the 'outturn.'
 - Survey the ship's tanks in order to quantify any cargo 'remaining on board' (ROB), which ideally will be zero. The ROB figure is applied to the ship's arrival figure (figure 3) in order to determine the amount of cargo that has been discharged (figure 5⁸). Figures 4 and 5 should theoretically be the same, although a difference of up to 0.1% is acceptable (this is known as the 'disport loss').
- The overall 'loss' is the difference between the bill of lading (figure 1) and outturn (figure 4). The total acceptable

loss is generally three times 0.1% for each of the three stages (load, transit, disport), so a total of 0.3%.

Note : That does not mean it is acceptable to lose none at load, none in transit, and then the whole 0.3% at the disport ! (although this does cause argument). Also, occasionally, one may experience a 'gain' at any of the three stages.

- 14) The shipment will have been successful when :
- Quality – set 3 samples are within the quality spec. The quality in the receiving shore tank after the discharge is irrelevant to the Master of the ship if set 3 was on spec.
 - Quantity – bill of lading versus outturn (figure 1 versus 4) is generally within 0.3%.
- When there is no issue of quantity, the ship's figures (figures 2, 3 and 5) are not needed.

As long as both 14a and 14b are satisfied, there will have been no issue, the ship leaves, and everyone should get paid.

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TO

Footnote

- Set 1 samples are taken from the shore tank before loading the ship
- Figure 1 is a number, and is the amount transferred from the shore tank
- Figure 2 is a number, and is the amount measured in ship's tanks at the load port after loading. Ship's

figures are subject to VEF which I will not go into here.

- Set 2 are samples taken from ship's tanks at the load port after loading
- Set 3 are samples taken from ship's tanks at the disport before discharge

⁶ Figure 3 is a number, and is the amount measured in ship's tanks at the disport before discharge

⁷ Figure 4 is a number, and is the amount received in shore tanks

⁸ Figure 5 is a number, and is the amount delivered by the ship based on ship's tanks



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