

CUSTODY TRANSFER SAMPLING AS A QUALITY ASSURANCE STRATEGY FOR MANAGING BUNKER PURCHASES EFFECTIVELY

Introduction

Marine bunkers in general account for as much as 40 per cent of a vessel's annual operating costs. Given the regular price fluctuations of this commodity, ship operators are very concerned about their fuelling expenses. It also does not help to note that the quality of bunkers has remained unpredictable and is in fact not expected to improve as a result of increased catalytic cracking activities in refineries. With this in mind, ship operators should be more vigilant during the delivery of bunkers to ensure their vessels receive the quality and quantity they have ordered and paid for.

As bunkers are delivered in tonnes, laboratory analysis of a "representative" sample taken during the fuel delivery is the only effective means of ascertaining the quality and quantity received. The reliability of the sample analysis in turn hinges on how and where the fuel sample is drawn. Obviously, the right equipment and sampling procedures must be used, but many ship operators overlook the importance of the correct sampling location.

This article explains in detail the importance of obtaining a representative fuel sample and how the sampling location can affect the representative quality of such a sample. It also examines the inadequacies and repercussions of current bunker delivery guidelines on the challenge of getting both buyers and sellers to agree on a common sampling point. Through a series of bunker delivery scenarios and examples of fuel delivery malpractice, the article suggests "custody transfer sampling" as a strategy for ship operators to manage their fuel purchases effectively, amidst rising bunker costs and inconsistent fuel quality.

Representative Fuel Samples and ISO 13739: 1998

The concept of bunker fuel testing was pioneered by DNV Petroleum Services (DNVPS) in 1980. The organisation has since conducted over 500,000 bunker quality tests and 30,000 bunker survey worldwide.

DNVPS assisted in the formulation of the Singapore Bunkering Procedures (SBP) in 1992. ISO TR 13739:1998, a technical report covering practical procedures for the transfer of bunker fuels to ships, was adapted from the CP60:1996, which was in turn a revision of the SBP.

Despite the potential role of ISO TR 13739:1998 in standardising bunker delivery practices, DNVPS is concerned about several ambiguities in this technical report. These ambiguities can exacerbate the existing problem of multiple fuel sampling if they are not rectified before the report graduates to an official ISO standard.

Multiple sampling arises when both the receiving vessel and the bunker tanker take their own samples during a single bunker delivery. In the event of a fuel quality dispute, it becomes difficult and time-consuming to determine which sample is representative and can be used as a basis for settlement. In this respect, the ISO TR 13739:1998 will only add to the confusion.

To begin with, Clause 10.4.2 of the technical report states: "...there is no single perfect location for obtaining a representative sample...the optimal location for obtaining (a) representative sample is at either end of the bunker delivery hose."

Since the sampling location is not specified, it is left open-ended. This is where the confusion develops.

Clause 10.4.3 of the report further states that “for practical reasons, the preferred sampling location is at the bunker tanker’s end of the delivery hose...other sampling locations such as the vessel’s end of the delivery hose may apply, if mutually agreed between the contracting parties”. This clause, obviously partial towards the bunker tanker crew, begs the question of why it should be practical and preferred for the ship’s chief engineer to sample the fuel at the bunker tanker.

For the ISO TR 13739:1998 to be fair to both parties, DNVPS advocates that the sampling location should be based on what is correct, and not what is convenient or preferred. This location would also have to be unique, technically correct and conforming to international commercial terms.

The term “mutually agreed between the contracting parties” in Clause 10.4.3 is also nebulous because many parties are involved in a bunker transaction. A typical scenario may be as follows:

A ship owner charters his ship to a charterer and this ship is then sub-chartered. The sub-charterer purchases bunkers through a broker in the United Kingdom who has a fuel supply principal in France. The principal, in turn, has a representative office in Singapore where the bunkers are stored with an independent tankage company. On the scheduled day of delivery, the bunker barge that is supposed to pick up the fuel is delayed and sends a sub-contracted barge to deliver the bunkers from the tankage company to the receiving vessel.

It is very likely that both the barge crew and the chief engineer are not aware of what has been originally agreed upon between the ship operator and the bunker supplier. They end up taking their own samples.

Should a bunker quality dispute then arise, the presence of multiple samples will not facilitate a speedy resolution at all.

Disputes aside, it is vital for any vessel to know the quality of the bunkers onboard for safety considerations. Imagine. If a vessel’s engine stalls in a violent storm because of poor quality fuel, lives may be at stake. Proper analysis of a representative sample will therefore help ship operators determine whether their bunkers are within quality specifications as stated in international guidelines such as ISO 8217: 1996.

Custody Transfer Sampling

The importance of a single and representative sample cannot be over-emphasised. Having established this, bunker suppliers and ship operators must next agree on a common point of sampling. DNVPS recommends this location to be at the point where the bunkers “change hands” – from the deliverer to the receiver. This is the point of custody transfer.

In the context of bunker delivery, transfer of custody means the risk of loss or damage to the bunkers is passed from the fuel supplier to the ship. It does not involve a change of title to the good. Indeed, if the bunkers have not been paid for by

the ship operator, the legal title will still be with the supplier even though the custody is now in the hands of the buyer.

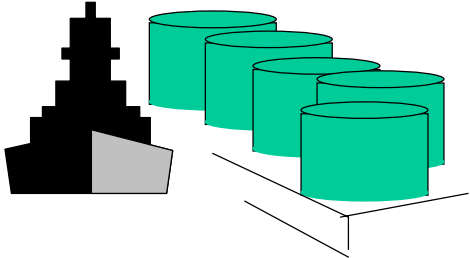
Incoterms 2000, published by the International Chamber of Commerce (ICC), further specifies that in a Free-on-board (FOB) transaction, "...the seller fulfils his obligation to delivery when the goods pass over the ship's rail at the named port of shipment" (page 49).

FOB is the most common agreement in bunker sales transactions. The ICC definition of the term implies that sampling at the point of custody transfer normally takes place at the ship's manifold during bunker delivery. The following examples illustrate this in different bunkering scenarios and also describe how custody transfer sampling at the ship's manifold produces a representative fuel sample.

Case A

In this case, the bunker transaction based on FOB terms is delivered at the supplier's terminal. If the ship comes alongside the terminal to be bunkered, custody transfer is at the ship's manifold. There will be only one location for the "umpire" sample to be taken and this is at the ship's manifold. The sample should be taken by manual or automatic continuous drip sampling method throughout the whole bunkering to ensure that a representative sample is obtained.

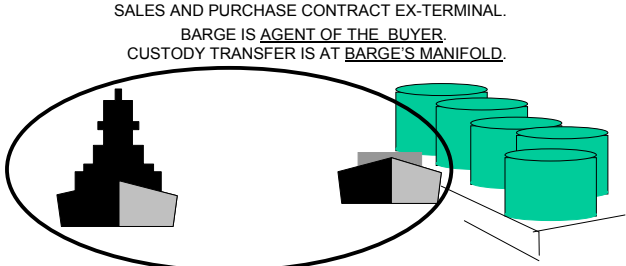
SALES AND PURCHASE CONTRACT BASED ON FOB.
CUSTODY TRANSFER IS AT THE SHIP'S MANIFOLD.



Case B

The transaction is based on FOB terms with delivery at the supplier's terminal. But this time, the ship is unable to come alongside the wharf because of draft limitations.

The buyer then engages a barging company to collect the fuel. The barge is now the agent of the buyer and goes to the terminal to collect the bunkers on behalf of the buyer.



SHIP IS ANCHORED OFFSHORE.
BARGE IS ENGAGED BY BUYER.

In this scenario, the barge is considered an extension of the ship (ie. the fuel purchaser) and the custody transfer position is located at the former's manifold.

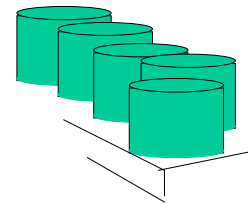
Once again, we will have only one representative sample between the ship and the bunker supplier.

Case C

Let us assume that the barge engaged by the fuel buyer has some contaminated remaining-on-board (ROB) fuel in its tanks before collecting "clean" bunkers from the terminal.

After the bunkers are collected on behalf of the buyer, the barge makes a delivery to the ship laying out at the anchorage. The ship then leaves port and subsequently suffers serious engine damage.

SALES AND PURCHASE CONTRACT IS BASED ON FOB EX-TERMINAL. BARGE IS AGENT OF THE BUYER AND DELIVERS TO THE SHIP. CUSTODY TRANSFER IS AT THE SHIP'S MANIFOLD BUT RELATES ONLY TO THE BARGING CONTRACT BETWEEN SHIP AND BARGE.



THE SUPPLIER HAS NOTHING TO DO WITH THE CUSTODY TRANSFER SAMPLE TAKEN AT THE SHIP'S MANIFOLD.

Here, the custody transfer sample taken at the ship's manifold during delivery by the barge has nothing to do with the bunker contract between the supplier and the buyer as discussed in case B.

In this scenario, the barge is an agent of the buyer and the custody transfer sample taken on the ship relates to the barging contract for the collection and delivery of the fuel.

Again, there is only one custody transfer sample involved, but this time in relation to the barging contract.

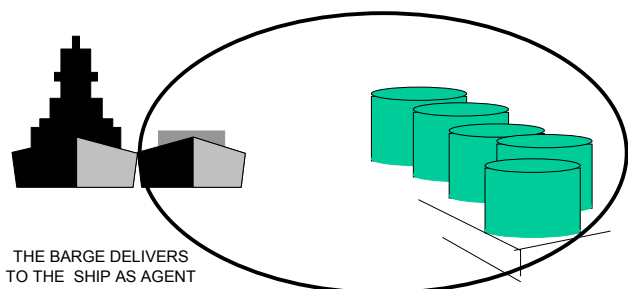
When the single sample is tested, it will show that the barge has delivered contaminated bunkers to the ship.

Case D

This is the most common situation where the ship purchases bunkers based on FOB terms for delivery at the specified port. The fuel is delivered by the supplier's own barge or a contracted barge. The barge is the agent of the supplier.

There is only one position for custody transfer and this is at the ship's manifold where a sample should be drawn.

SALES AND PURCHASE CONTRACT BASED ON FOB AT DESIGNATED PORT, DELIVERY BY BARGE. THE BARGE IS AGENT OF THE SELLER AND CUSTODY TRANSFER IS AT THE SHIP'S MANIFOLD.



THE SUPPLIER IS RESPONSIBLE FOR THE ACTIVITIES OF THE BARGE.

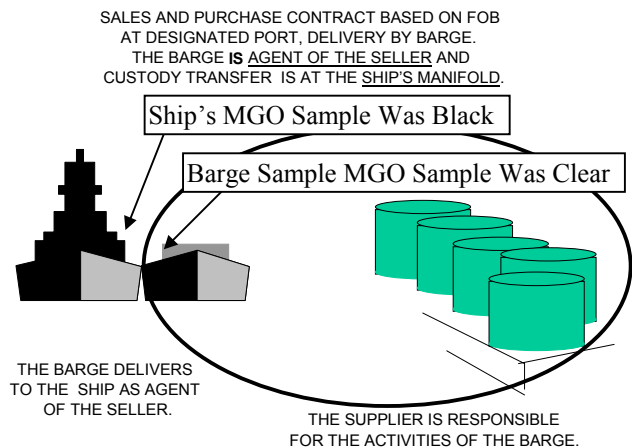
Case E

The buyer has ordered 2,000 tonnes of 380 Cst and 200 tonnes of marine gas oil (MGO) for delivery to his ship on FOB terms. The barge makes the delivery on behalf of the supplier. When he is about to pump the MGO, the barge cargo officer discovers that he does not have a clean bunker hose. He then decides to go ahead with the dirty hose, unaware that it is highly contaminated with abrasive catalytic fines from a previous de-bunkering job.

During the bunker delivery, the ship's chief engineer takes samples for the 380 Cst as well as the MGO at the ship's manifold, while the cargo officer of the barge insists on taking his own samples at the barge manifold.

The MGO sample taken by the chief engineer at the ship's manifold turns out to be dark in colour as it gets contaminated while passing through the dirty bunker hose. On the other hand, the sample taken by the cargo officer at the barge end of the hose is bright and clear.

When the ship's generators suffer extensive damage, the sample drawn by the chief engineer is sent for lab tests, revealing subsequently that the MGO is off-specification.



Meanwhile, the sample taken by the cargo officer is found to be of acceptable quality. The supplier therefore claims that he is not to be held responsible for the poor quality bunkers.

It becomes apparent from the above example that where the fuel sample is taken does make a difference. Here, the sample at the ship's manifold would be the one correctly reflecting the quality of the fuel delivered to the ship.

If custody transfer sampling becomes a part of the prospective ISO standards on bunker delivery, it will ensure an indisputable sampling location essential for producing a single and representative sample of the delivered bunkers. Fuel quality disputes will thus become easier to resolve as both the bunker supplier and the buyer refer to the same sample.

DNVPS notes that the ISO 8217:1996 is also in line with the concept of custody transfer sampling. The document "sets out the required properties of the fuels at the time and place of custody transfer." From this clause, custody transfer sampling is doubtless the correct position for drawing a representative sample.

Examples of Bunker Delivery Malpractice

As the market leader in fuel quality testing and bunker surveys, DNVPS is well aware of the various grey practices in the bunker trade. When sampling is done at the barge's manifold, dishonest fuel suppliers often resort to "bypass lines" or "dead-leg" sampling to cheat unsuspecting ships. These chicaneries are often difficult to detect because the barge's end of the bunker hose is enclosed and cannot be inspected. On the other hand, the ship's end of the hose is open.

Some unscrupulous bunker suppliers are also known to mislead ship crews by replacing samples from the "off specification" bunkers being delivered with those taken from quality sources before the bunker delivery.

Manipulation of the sampling valve is another critical issue. Bunker barges have a pumping capacity of up to 1,000 tonnes per hour, and if the sampling valve at the

barge's manifold is turned off for six minutes, the barge crew can deliberately pump 100 tonnes of seawater into the ship's tanks without affecting the contents in the sampling container at all.

Assuming that the average bunker price is US\$150 per tonne and the pumping rate is 500 tonnes per hour, the ship should receive US\$7,500 worth of fuel during the six minutes when the sampling valve is turned off, instead of 50 tonnes of worthless sea water. Meanwhile, the tampered sample at the barge's manifold will show a perfectly acceptable fuel.

If fuel sampling takes place at the ship's manifold, sample tampering can be effectively checked as it will become much easier for the ship crew to monitor the sample collection.

Support for Custody Transfer Sampling

The adoption of custody transfer sampling as an industry standard will obviously benefit ship operators. In fact, the bunker industry will also do well to accept this practice because it encourages conscientious bunker delivery. This will help the suppliers build up a reputation for reliability and enable them to secure repeat custom from ship operators.

Many bunker suppliers continue to resist custody transfer sampling, if only because fuel sampling is traditionally done on the delivery barge and it takes effort for the barge crew to get used to new practices. But change is a necessity in any dynamic environment. If the bunker industry is to continue progressing, it must adapt.

Some suppliers may also argue that fuel sampling at the barge should stay because the barge crew is more experienced.

Does turning on a valve require much expertise ? And if bunker suppliers claim that not all ships are equipped with line samplers, an easy solution is to attach the barge's sampler to the ship's end of the bunker hose. In this way, custody transfer sampling can still be practised while allowing the barge to retain ownership of the sampler.

Another possible argument against sampling on the ship is that the barge crew, especially in the US, cannot board the ship. This situation can be circumvented by installing a video camera at the bunker boom of the barge. The entire bunkering and sampling processes can then be easily observed and recorded by the barge crew.

It is heartening to note that a growing number of maritime organisations are beginning to appreciate the benefits of custody transfer sampling. In this regard, DNVPS has secured endorsements from **BIMCO**, **Intertanko**, **IBIA** (International Bunker Industry Association) and the **Maritime and Port Authority of Singapore** (MPA). The MPA has in fact started the process of amending the Singapore code of practice for bunkering (CP 60: 1996) to specify the custody transfer sample as the official sample for all local bunker deliveries.

Major shipping companies which support custody transfer sampling include Bergesen, Klaveness, Neptune Orient Lines, American President Lines, Star Cruises, Gearbulk and Denholm Ship Management.

At the end of the day, sampling at the point of custody transfer boils down to a unique sampling location and a single fuel sample. It is an equitable practice based on what is correct, and not what is convenient.

As a quality assurance practice in bunker management, custody transfer sampling helps ship operators derive an accurate sample from the right sampling location. This sample can then be analysed to determine the quality and quantity of the delivered fuel, in turn ascertaining if the buyer has received his money's worth.

Against the current background of fluctuating bunker prices and unpredictable fuel quality, custody transfer sampling is clearly the right way to go. Support it.