

# The Bunker Detectives®

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## Loss Prevention Bulletin - AVA/2013/0005

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## **MALPRACTICES** in BUNKERING OPERATIONS

### **About Bunker Detective:**

Bunker Detective is an exclusive division of AVA Marine Group Inc.

AVA Marine is a professional marine surveying and consultancy firm – founded and led by its principal marine surveyor Kaivan H. Chinoy. The Company provides a comprehensive range of specialist marine surveying, marine loss control & consultancy services primarily in Western Canada and the West Coast of the United States

To learn more about our marine surveying capabilities, visit our website at [ava-marine.com](http://ava-marine.com) / [bunkerdetective.com](http://bunkerdetective.com)

AVA Marine | Bunker Detective is also the member of the **AIMU** (American Institute of Marine Underwriters), **CBMU** (Canadian Board of Marine Underwriters) and **MIABC** (Marine Insurance Association of British Columbia) and the **IBIA** (The International Bunker Industry Association)

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## Overview:

The following article gives a brief insight on dubious practices employed by bunker fuel suppliers during a typical bunker stem operation. These mal-practices are more prevalent in Asian ports than in North America or Europe. Having said that no matter which part of the world the vessel is fixed to stem bunkers, the importance of accurately measuring the barge fuel tanks before and after delivery is a crucial phase in any bunker stem operation.

It is therefore very important that the vessel's bunker operation team methodically take the barge tank measurements, applying the correct trim/list before and after bunkering, recording the actual temperature of the bunker fuel before/after delivery etc. Proper temperature measurement alone can save thousands of dollars!

Disputes can arise either by innocent mistake or deliberate short supply by the barge; like introducing air to froth up the fuel (cappuccino effect) or giving incorrect temperatures and so on. Also when bunker is being transferred from a refinery to a storage tank and to the barge and then delivered to the vessel, there is a lot of scope for errors and deliberate manipulations that will result in a difference (sometimes quite significant) between the quantity claimed to have been supplied and the quantity received by the ship. If this is due to an innocent mistake then probably with fullest co-operation of the barge company/fuel suppliers and full disclosure of stock movement records might indicate the "missing" bunker. However, often this is not the case and experience tells us that when disputes do arise over quantity transferred, any 'post-delivery' investigation on quantity shortages are often inconclusive especially if the shipboard personnel involved in bunkering operation have neglected the basic principles of safeguarding it's owners/charterers' rights in way of collecting and preserving evidence. Protests, legal fees, etc. all add on to costs with usually neither party actually concluding with certainty what transpired on board. A success of any bunker dispute claim will largely depend on the detailed contemporaneous written evidence by the shipboard personnel at the time the supply is made.

Considering the present bunker fuel prices we deem "bunker stem survey" absolutely necessary, in order to make sure that the quantities as mentioned on the Bunker Delivery Note (BDN) are true and correct. However, there are many ship operators who leave the above procedure to the Chief Engineer to save on survey cost with the vessel often ending up with an incorrect supplied quantity and a commercial loss of thousands of dollars for the operators.

It is important to note that when a surveyor is appointed by the charterers / owners to oversee the stemming operation, the Master/Chief Engineer is still in charge of ensuring proper steps have been taken to prevent such malpractices and that the surveyor should be assisting and working under the Chief Engineer's supervision and not the other way around.

'Unfortunately 'stealing bunker fuel' for profit due to increasing fuel prices is here to stay for a long time to come'

Loss prevention during bunker stemming largely depends on the hands-on approach and practical experience of bunker surveyors and AVA Marine's exclusive division "**Bunker Detective**" is able to offer these 'Bunker Stem Surveys' to ship owners and charterers globally.

This guidance should not be construed as exhaustive and is aimed primarily for vessel operators and ship owners to educate their shipboard personnel for better detection and prevention of these malpractices for occurring in the first place.

## **What the ship owners and operators need to know:**

The ship owner and the charterer both have the responsibility for the provision of bunkers – in a time charter the charterers will provide bunkers whereas in a voyage charter the owners will normally supply bunkers. Therefore it is important for both the owners and the charterers to be aware of the tricks of the trade during bunker stem operations.

### **Tricks of the Trade:**

- 01. Understanding the Fuel Density & Weight Relationship**
- 02. Understanding the Fuel Temperature & Volume Relationship**
- 03. The Cappuccino Bunkers: (also sometimes known as the Coca Cola Effect)**
- 04. Fuel Delivered with High Water Content**
- 05. Inter-tank Transfers (gravitating of fuel)**
- 06. Flow meter/Pipe work Tampering**
- 07. Quantity measurements by flow meter only**
- 08. Pumping / Mixing Slops into Bunkers**
- 09. Questionable Tank Calibration Tables**
- 10. Tampering with Gauging Equipment**
- 11. Empty Tanks -Unpumpable Fuel (Zero Dip Volume Application)**
- 12. Inflated / Deflated Tank Volumes**
- 13. Under-Declaring actual ROB and Deliberate Short-Supplying of Fuel**
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## 01. Understanding the Fuel Density & Weight Relationship

Marine fuel is always sold by weight (mass) and delivered by volume. Hence for this reason bunker receipts must always be signed "For Volume Only" and adding the words "weight to be determined after testing of the representative sample". Never sign for weight if uncertain about the density.

What many bunker surveyors do not realize is that the density given in the supplier's bunker delivery note (BDN) may not be true and thus the weight determined by calculation should be considered as the 'preliminary' weight of the fuel transferred to the vessel. The actual weight is only determined after the density is verified by an independent fuel testing authority and then factored into the final recalculation of the actual weight of the fuel delivered onboard. That is why we always stress the importance of accurately obtaining bunker samples both onboard the vessel and the barge.

Once the samples are dispatch to the vessel's chosen independent fuel testing laboratory we request the copy of the Fuel Test Reports so that revised bunker survey report can be sent to the client. This procedure assists our clients in avoiding commercial losses. Below is typical scenario of how density can affect the weight of fuel transferred on board.

A ship owner/charterer has a fleet of 20 vessels bunkering an average of 1000 MT each month.

Fuel Cost \$ USD /MT	650.00	\$ USD
Bunker Stemmed per month x 20 vessels	20,000.00	MT
Density of Fuel @ 15 C (BDN Value)	0.9889	
Density of Fuel @ 15 C (TESTED VALUE)	0.9865	
Density Differential	0.0024	
Short Delivery per vessel per month (approx.)	<b>-2.50</b>	MT
Commercial Loss per vessel per month	-1,625.00	\$ USD
Fleet Commercial Loss per month	-32,500.00	\$ USD
<b>Fleet Commercial Loss per year</b>	<b>-390,000.00</b>	\$ USD

Now imagine a charterer operating a fleet of 50, 70 or 100 vessels – the commercial loss would be valued in millions of dollars every year!

### Key Notes:

- If the density of fuel cannot be verified onboard or independently verified at the time of bunkering, the BDN should be signed only for 'volume' and not for weight
- Remember whenever in doubt or have concerns always issue a letter of protest

## 02. Understanding the Fuel Temperature & Volume Relationship

Petroleum products have a high rate of thermal expansion which must be taken into account when several thousand tons are transferred or purchased. The barge will often try to under-declare the temperature during the opening gauge and over-declare during the closing.

This malpractice is quite common in day to day bunkering and therefore we always ask the ship officers responsible for bunkering operations to be extra vigilant and check the temperatures of all bunker tanks during the opening gauge and thereafter periodically check and record the temperature of the fuel as it is pumped onboard. The temperatures should be checked both at the barge and the ship's manifold. If temperature gauges are provided it would be prudent to take photographs where permissible.

The barge will often try to under-declare the temperature during the opening gauge and over-declare during the closing. Always verify temperatures of all bunker tanks during the opening gauge and thereafter periodically check and record the temperature of the fuel as it is pumped onboard. The temperatures should be checked both at the barge and the ship's manifold and average of all the readings taken during final calculations. If temperature gauges are provided it would be prudent to take photographs where permissible.

Also note that the existing flow measurement systems will have a separate temperature and pressure gauges where these could easily be tampered with or gauges not being accurate like non-aqueous liquid filled gauges with glycerine and silicone oils often seen with broken sight glass. The whole purpose of a liquid filled gauge is for the liquid to absorb vibrations, thus providing a dampening effect to enable accurate readings and also to reduce wear and tear by lubricating all moving parts – in other words this affects the integrity and reliability of the gauge readings over time.

There have been cases where the glass in the mercury cup case thermometer is gently heated to create a bubble effect to prevent the correct registering of the temperature of the fuel oil. This malpractice could be illustrated by the following example:

### AT OPENING GAUGE (UNDER-DECLARING TEMP)

Actual Temperature	53.0
Declared Temperature	40.0

GOV m <sup>3</sup>	Density @ 15 C (g / ml)	Temp C	VCF T (54B)	GSV m <sup>3</sup> @ 15 C	Weight (MT) (in Air)
1000	0.9889	53.0	0.9738	973.8	961.92
1000	0.9889	40.0	0.9828	982.8	970.81
					<b>-8.89</b>

Loss or Gain

Approx. Commercial Loss **-\$5,778.50** \$ USD

Within a large fleet the loss could run into millions of dollars a year!

**Key Notes:**

- Always check and record the temperatures of the fuel tanks before and after and periodically during bunkering operation
- Carry own infra-red laser temperature gun as a part of your equipment
- Remember whenever in doubt or have concerns always issue a letter of protest

### **03. The Cappuccino Bunkers: (also sometimes known as the Coca Cola Effect)**

This essentially may be described as frothing/bubbling effect caused by compressed air blown through the delivery hose. The aerated bunkers when sounded will give the impression that the fuel is delivered as ordered. In fact after sometime when the entrapped air in suspension settles out of the fuel oil the oil level drops and a short fall is discovered. In large bunker deliveries this could be considerable with huge financial implications.

We have often been asked why the flow meter cannot detect the air being introduced in the system and compensate accordingly. Well, most flow meters in use today are of either the wrong type or the wrong size. In other words are not technologically advanced. All the standard flow meters will only measure the volume of throughput and not the actual mass of fuel being delivered. As a result when is air introduced into the system, which is essentially 'small air bubbles' - the flow meter will register it as volume.

However, there are flow meters out in the market which are capable of measuring the true quantity (mass) of the fuel delivered. One such meter is the 'Coriolis Mass Meter' - it has been in existence for quite some time now and only getting better. Coriolis meters take direct mass flow measurements using the Coriolis Effect (a deflection of moving objects when they are viewed in a rotating reference frame - we won't be discussing this effect as this is beyond the scope of this article). Coriolis meters are less sensitive to pressure, temperature, viscosity, and density changes, allowing them to measure liquids, slurries and gases accurately without the need for compensation. These meters having no moving parts require little maintenance however, the initial cost and line modifications is usually a deterrent for many ship operators for not installing it.

#### **Precautions against Cappuccino Bunkers:**

##### Before Fuel Transfer

At the time of opening gauge fuel oil should be observed from ullage hatches for any foam on the surface of the bunkers. Foam may also be detected on the ullage tape. If there is no foam then the oil level on the tape should appear distinct with no entrained bubbles. If by observation of the tape and the surface of the fuel you suspect entrained air then obtain a sample of the fuel by lowering a weighted bottle into the tank. Pour the sample into a clean glass jar and observe carefully for signs of foam or bubbles.

If these observations show entrained air the Chief Engineer should not allow the bunkering to start and notify the owners / charterers immediately. The barge Master should be issued with a letter of protest and a copy sent to the ship's agent. If the barge Master decides to disconnect from the ship and go to another location then the agent should immediately inform the port authority and try to establish where the barge has gone. All relevant times and facts should be recorded in the deck log book.

##### During Fuel Transfer

If the Chief Engineer has not observed any entrained air during the initial barge survey it is still possible that air can be introduced to the barge tanks or the delivery line during the pumping period for example by introducing air into the system by crack opening the suction valve of an empty bunker tank while pumping from other tanks. Hence it is important for the Chief Engineers to continue gauging the ship's receiving tanks while the bunkering is in progress as air bubbles would be readily seen on the sounding tape.

The Singapore Bunkering Procedure SS 600 prohibits the use of compressed air from bottles or compressors during the pumping period or during stripping and line clearing. It should be confirmed with the barge Master that he will follow this procedure (Reference SS600 paragraphs 1.12.10/11/12/13). Stripping of barge tanks can also introduce air and stripping should only be performed at the end of the delivery for a short period of time. The barge Master must agree to inform the Chief Engineer when he intends to start stripping and when it has been completed.

Ship's crew and surveyor need to be alert during bunkering and check for the following signs:

- Bunker hose jerking or whipping around.
- Gurgling sound when standing in vicinity of bunker manifold.
- Fluctuations of pressure indication on manifold pressure gauge.
- Unusual noises from the bunker barge

#### After Fuel Transfer

It is also possible to introduce air into the delivery line during blowing through at high pressure. Therefore it is imperative that the barge informs the ship before and after blowing through is completed so that the ship crew can be extra vigilant during this period.

The ship's bunker manifold valve should be checked shut before gauging of the vessel's tanks.

#### **Key Notes: (IDENTIFYING CAPPUCCINO BUNKERS)**

- Signs of froth/foam on the surface of the fuel in the barge tanks during opening gauge
- Excessive bubbles on the sounding tape prior to, during and after bunkering
- Bunker hose jerking or whipping around
- Slow delivery rates than what has been agreed
- Gurgling sound in vicinity of bunker manifold
- Fluctuations of pressure on manifold pressure gauge.
- Unusual noises from the bunker barge

Note that hose jerking or evidence of sporadic bubbles superficial in nature after line blowing or stripping of tanks is fairly common and should not be construed as evidence of mal-practices.

#### 04. Fuel Delivered with High Water Content

Traces of water in bunker fuel are normally very low about 0.1-0.2% by volume. ISO 8217:2010 Fuel Standards for 'Marine Residual Fuels' gives the maximum allowable water content to be 0.5 % v/v.

Water can originate from number of sources like heating coil damage causing leakages and tank condensation; however deliberate injection cannot be ruled out. In case large quantity is found then a letter of protest should be issued immediately. However, the exact quantity of water can only be determined after the settlement phase where the water would have settled down at the bottom of the bunker tank.

##### **Key Notes:**

- High water content causes other issues like removal costs to ashore if the OWS (Oily Water Separator) onboard is not able to filter it out and also reduces the fuel's specific energy
- Fuel samples provided by the barge may not have any traces of water as the samples may have been taken prior to bunkering and mixing of water. Always ensure that the fuel samples are collected during bunkering and not before or after. For these reasons never sign labels in advance or sign for samples of unknown origin. Samples should only be signed for those actually witnessed.
- Use of water-finding paste on the sounding tape is good for distillate fuels only and does not work with residual fuels. Even incorrect type of 'water-detecting' paste could be used.
- On-site testing should be done for water-in-oil test. It may be not viable for the ship operators to invest in high end equipment for such purposes but as a minimum the vessel should be able to test a bunker representative fuel sample for water, test for density and compatibility.
- Remember whenever in doubt or have concerns always issue a letter of protest

## 05. Inter-tank Transfers (gravitating of fuel)

During opening gauge the fuel could be transferred from high level to a low level (or empty / slack tank) by gravity. For example a barge may have four tanks 1P/1S, 2P/2S, 3P/3S and 4P/4S. The opening gauge starts from say aft tanks 4P/4S. While the gauging is underway, the tank level of 4P/4S could be easily dropped under gravity to a slack or empty tank forward say 1P/1S. Thus essentially the same fuel quantity is measured twice.

This method is still in use and if not detected the barge can claim that full quantity was delivered to the vessel but the vessel will have a substantial shortfall. Once the bunkering has commenced it is too late to do anything and it will be virtually impossible to trace the 'missing' fuel. A thorough investigation will be needed to determine the exact stock control quantity and full disclosure from the supplier which can take many months/years of legal action and still the matter may not be resolved.

It is imperative that the attending surveyor or vessel's representative re-gauges the tanks in the following sequence:

If the initial gauging was forward to aft, then after gauging the last aft tank; the surveyor or vessel's representative should re-gauge all tanks from aft to forward. The readings should be exactly the same.

As an additional precaution, at the commencement of bunker transfer, the surveyor or vessel's representative should re-gauge the first tank(s) used to transfer oil to the vessel. The reading should match that taken during the initial gauging.

### Key Notes:

- The only effective way of dealing with this dubious practice is re-sounding the tanks as above before bunkering commences
- Remember whenever in doubt or have concerns always issue a letter of protest

## 06. Flow meter/Pipe work Tampering

Bunker barges fitted with a flow meter should be checked for proper functioning by sighting a valid calibration certificate and ensuring the seal is intact.

There may also be unauthorised piping (by-pass lines) fitted to the flow meter running into the pump suction side and thus this un-authorized contraption will register the throughput of fuel twice through the flow meter.

### **Key Notes:**

- Verify flow meter seal is intact
- Verify validity of the calibration certificate and that it is for the same type flow meter
- Look out for any suspicious by-pass lines running after the flow meter
- Consult the barge piping diagram if in doubt
- Remember whenever in doubt or have concerns always issue a letter of protest

## 07. Quantity measurements by flow meter only

The barge may claim that the soundings and ullage ports have been sealed by customs or seized or some other reasons and therefore force the vessel to go by the volumetric flow meter only. Remember that this may be just the first sign of an unscrupulous barge Master as such we wary of other tricks of trade.

### **Key Notes:**

- Never agree and go by the flow meter only fuel delivery
- Remember whenever in doubt or have concerns always issue a letter of protest

## 08. Pumping / Mixing Slops into Bunkers

Though we seldom come across this now because of tighter sampling procedures in place but introducing slops and thus contaminants into the fuel delivery will reduce the actual fuel amount and also can create engine problems down the line. Unfortunately this cannot be detected until the representative fuel samples have been tested by an independent fuel testing facility.

A typical scenario where this mal-practice would be carried out is after an argument over short supply; the barge would pump in sludge / water to make up for the short supply. As the sample collection would have been completed; it is therefore imperative that if allowed a second pumping re-sampling is done both on the barge and the vessel.

### **Key Notes:**

- Always witness and collect samples by continuous drip method i.e. the sample to be drawn continuously throughout the bunkering delivery period
- It should be a practice onboard to isolate the fuel delivered to separate tanks and not to be consumed until such time the fuel testing report gives a clean bill of health.
- In case of second pumping re-sampling should be carried out both on the vessel and the barge to ensure no contaminants like sludge/water is been delivered to the vessel.
- Fuel contamination amongst other things can create problems with the fuel injection system and exhaust valves with costly repairs.
- Remember whenever in doubt or have concerns always issue a letter of protest

## 09. Questionable Tank Calibration Tables:

Verify that the sounding / ullage tables are approved by the Class (Class Certified – with endorsement). Having more than one set of sounding book is not uncommon and having the tables modified to the supplier's advantage is always a possibility. Inserted pages, corrections, different print/paper type are all indications of tampering. Sometimes the barge may have a new calibration table (with the old one being obsolete). This could be following modification of the tanks internal structure during a dry dock repair or simply because the original calibration tables would have been incorrect. Always find out the reason for new calibration table and making sure it's Class Certified.

The same could be said for the list / trim correction tables which could be easily modified again to the supplier's advantage.

### **Key Notes:**

- Look for Class Approved calibration tables with endorsement
- Remember whenever in doubt or have concerns always issue a letter of protest

## 10. Tampering with Gauging Equipment

Always verify the condition of sounding tape. Sounding tapes could be tampered with in many ways:

1. Deliberate altering of sounding tapes and using wrong size of bobs
2. Sounding bobs from tapes that have been switched over
3. Cutting the tape and re-joining resulting in non-linear tape



Note: Photos provided by our surveyor network

### Key Notes:

- Check for calibration certificate for the gauging equipment in use
- Use a ruler to ascertain the precise sounding/ullage when below the 20 cm mark
- Use own sounding / ullage tapes
- Pay particular attention to 'millimeter' soundings especially when the tanks are full and taking ullages as small errors will have a big impact on the total bunker quantity.
- Remember whenever in doubt or have concerns always issue a letter of protest

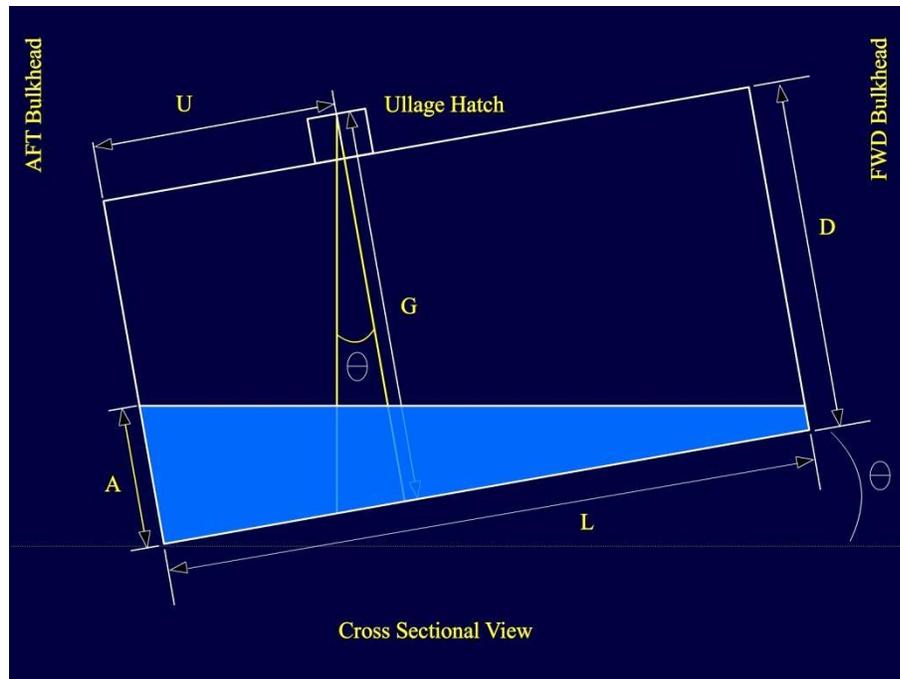
## 11. Empty Tanks -Unpumpable Fuel (Zero Dip Volume Application)

In an event of a short delivery be wary that empty tanks may not be empty even with zero dip and that substantial pumpable may exist. Verify the tanks claimed to be empty – don't take the supplier's word for it.

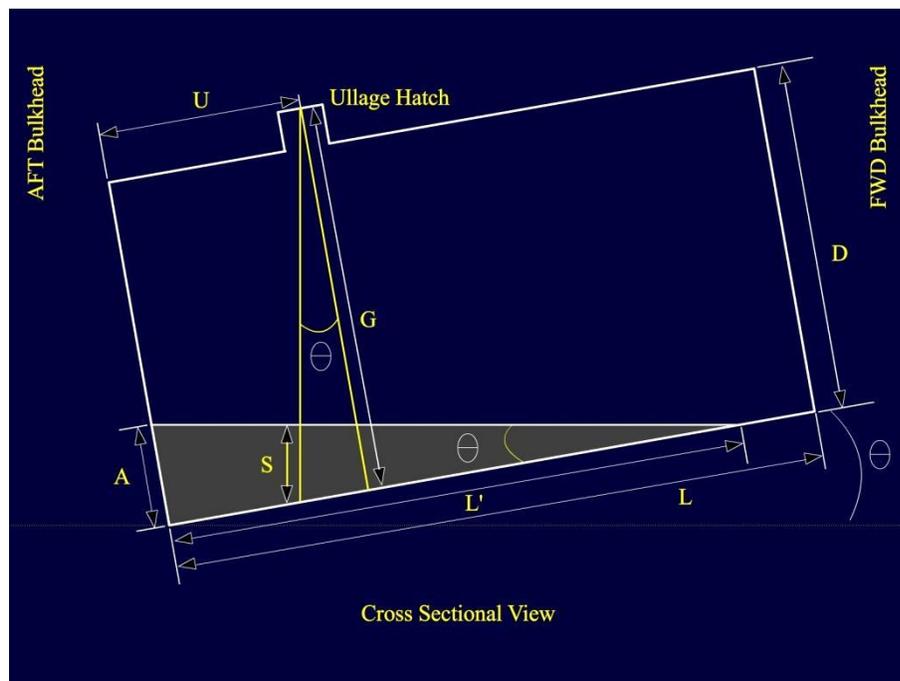
Zero dip volume application principle - The bunker surveyor or the vessel representative should notify the barge representative that the zero dip volume of the tank(s) shall be included in the bunker tanker calculations. The condition shall be deemed to apply when the closing gauge would indicate no oil cut whereas the visual inspection of the bunker tanker cargo tank indicate free flowing oil at the aft of the tank. To avoid zero dip volume application, sufficient bunkers should be retained in cargo tanks such that it touches all four sides of the tank.

To apply zero dip correction - it is assumed that the tank is rectangular where the sounding is not constrained by a sounding pipe – i.e. sounding should be taken in an "open sounding" position (from the hatch) where the sounding tape bob is free to travel with the trim of the barge and not restricted by the sounding pipe. However, if the tape is used inside a sounding pipe this correction would be invalid.

Liquid cargo should only be trim and/or list corrected if the liquid is in contact with all bulkheads. When the liquid is not in contact with all bulkheads, a wedge correction should be applied.



No wedge – use normal trim tables



Wedge exists – use wedge tables or wedge formula

**\*Cut** - The oil level on the tape or bob or the water level marking on a tape or bob coated with water indicating paste. "Taking a cut" is taking a measurement of the oil or water level.

**Key Notes:**

- Do not assume any tanks to be empty even when reaching stripping level
- Check tank calibration tables to verify the unpumable
- Apply correct list / trim corrections during calculations
- Remember whenever in doubt or have concerns always issue a letter of protest

## 12. Inflated / Deflated Tank Volumes

Level of oil on the tape / bob should be clearly identifiable (same colour and viscosity as the rest of the oil in the tank).

Soundings can be inflated during opening gauging by pouring diesel oil into the sounding pipe just before gauging.



Sounding at the time of pouring diesel oil



Sounding re-checked after sometime

Another method of inflating the sounding is high pressure compressed air being injected directly into the sounding pipe, pressurizing the pipe and thus causing the level of oil to rise giving a higher reading without even frothing or creating bubbles. This would be done en-route to the vessel just before delivery.

The reverse is true – that is the soundings can be deflated during closing gauging by pouring copious amount of paint thinner into the sounding pipe just before gauging. The thinner washes off the oil level marking on the sounding tape to indicate less oil.

Note: Photos provided by our surveyor network

### Key Notes:

- Always check the level of on the sounding tape and if in doubt re-gauge the tank
- Remember whenever in doubt or have concerns always issue a letter of protest

### **13. Under-Declaring actual ROB and Deliberate Short-Supplying of Fuel**

Why it is important for the ship operators to ascertain the exact fuel quantity onboard prior stemming bunkers?

The mal-practices during bunkering operations which we see and hear about though quite prevalent with bunker suppliers; but on many occasions we have come across situations where the receiving vessel will be as much as involved as the supplier in these dubious practices. Often we have found that the vessel would under-declare fuel quantity which is then either sold back to the barge supplier or simply kept hidden on the vessel until an opportunity comes along to profit from this.

For example: An order for 1000 metric tons of FO is placed at the next bunkering port - the vessel has an excess of 50 metric tons (un-declared). Now when the supply barge comes alongside (through prior negotiations) the vessel would deliberately short-receive (or barge will deliberately short-supply) 50 tons. In other words the actual supplied quantity would be 950 tons but on the BDN it would be reported as 1000 tons and the operator will be invoiced based on this BDN quantity. The short-received (or short-delivered bunker) profit will be shared between the supplier and the vessel. In the end it's the operator who is affected – suffering the loss twice (50 tons + 50 tons).

#### **Contributing factors for the loss:**

- Too much reliance on the vessel's staff
- No bunker stem audits are conducted which involves elaborate detective work carried out by independent third party surveying firms
- Ignoring non-nominating (non-receiving) tanks to be included in the overall tank measurements during stem operations.
- Most shipping companies will engage the services of an independent surveyor to protect their interest in case of a large discrepancy in the final figures between the barge and the vessel; however, how many companies actually give clear instructions to the attending surveyor to measure all non-nominated tanks (non-receiving tanks)? Or how many surveying firms actually carry out the measurements diligently? Failing to do so leaves the operator vulnerable as explained above.

This is further illustrated as follows:

### Scenario 1: Under-declaring - To Ship Owners Advantage

Bunker stemmed by the vessel operator	1500.00	MT
ROB as per log book (arrival bunkering port)	350.00	MT
<b>Un-declared fuel onboard</b>	<b>53.00</b>	MT
Actual Bunker stemmed	1500.00	MT
Quantity declared on BDN	1500.00	MT
Final ROB declared in log book after bunkering	1850.00	MT
However, Actual ROB would be	1903.00	MT
Fuel Cost \$ USD /MT	650.00	USD
<b>Losses for the Operator</b>	<b>-34,450.00</b>	USD

The excess 53 MT of fuel oil will be in favor of the owners with a loss to the charterers

### Scenario 2: Under-declaring - With the Aim to Profit for Personal Gain

Bunker stemmed by the vessel operator	1500.00	MT
ROB as per log book (arrival bunkering port)	350.00	MT
<b>Un-declared fuel onboard</b>	<b>53.00</b>	MT
Actual Bunker Stemmed ( <b>deliberate short supply</b> )	1447.00	MT
Quantity (incorrectly) declared on BDN	1500.00	MT
Final ROB declared in log book after bunkering	1850.00	MT
Actual ROB would also be	1850.00	MT
<b>So where did 53 MT disappear?</b>	<b>You guessed it!</b>	
Fuel Cost \$ USD /MT	650.00	USD
<b>Losses for the Operator will be double</b>		
• for under-declared fuel	<b>-34,450.00</b>	USD
• for the short-supply fuel	<b>-34,450.00</b>	USD
	<b>-68,900.00</b>	USD

#### Key Notes:

- Carry out regular 'bunker stem audits' – in a large fleet this is an indispensable loss control tool
- Measure all non-nominated tanks prior to stemming operations and again after bunkering is completed
- Always engage the services of a reputable bunker stem surveying firm during stem operations.

## About this Bulletin

The primary function of Bunker Detective as a marine consultancy firm is 'Loss Prevention' by focusing on best practices to help avert those claims that are considered avoidable and by playing an active role in keeping the shipping industry informed.

The bulletins will be circulated to the Marine Industry and P&I Clubs so that its members are kept informed. We respect your privacy and in case you do not wish to receive these bulletins then please let us know and your name shall be removed from the mailing list promptly. Contact for Bunker Detective:

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