

# BIMCO & IBIA BUNKERING GUIDE



THE INTERNATIONAL BUNKER  
INDUSTRY ASSOCIATION

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# BIMCO

# Introduction

Due to the relentlessly rising price of oil and ever-increasing marine environmental protection awareness, the bunkering of ships, which was once a relatively low skill, low value, activity has evolved into a highly focused shipboard operation in terms of regulatory compliance, and quality and quantity assurance.

The purpose of this guide is to assist a ship's officers and crew involved in bunkering operations to act in compliance with applicable regulations and industry best practice; the guide will also be of value to shore staff.

This guide aims to provide general information, advice and guidance. Detailed guidelines, instructions and procedures are available in the ship's Safety Management System (SMS) and the Shipboard Oil Pollution Emergency Plan (SOPEP) or Shipboard Marine Pollution Emergency Plan (SMPEP) as appropriate.

Many owners also have their own specific requirements for the conduct of bunkering operations which are more detailed than the minimum requirements in the operational procedures contained in the vessels SMS, SOPEP or SMPEP, especially with regard to commercial considerations.

Bunkering operations are governed in general terms internationally by the IMO's MARPOL Annexes I & VI. SOLAS Chapter VI Regulation 5.1 also requires that a Material Safety Data Sheet be provided for oil products carried on board ships. In addition to the IMO regulations, many states, and even individual ports, have their own regulatory regimes covering bunkering operations. It is of paramount importance that prior to commencement of any bunkering operation, a check is made with the local agent and/or bulk supplier for information and guidance pertaining to the local regulations.

The MARPOL Annex VI sulphur limits and application dates are as follows:

- 1 July 2010 – Sulphur cap in Emission Control Area's (ECA's) reduced from 1.50% to 1.00%
- 1 January 2012 – Global sulphur cap to be reduced from 4.50% to 3.50%
- 1 January 2015 – Sulphur cap within ECA's to be reduced to 0.10%
- 1 January 2020 – Global sulphur cap to be reduced to 0.50%

# Fuel Types

There are two types of bunker fuel oil:

- Residual fuel – available in varying viscosities and high and low sulphur variants
- Distillate fuel - marine diesel & gas oil

Residual fuels are a mix of refinery residual fuel and distillates blended to meet specification requirements.

Distillate Fuel (which is product obtained by condensing the vapours distilled from petroleum crude oil or its products) comes in two variants and again, both are available with varying levels of sulphur content:

- Marine Gasoil – (MGO) clear and not containing any residual component
- Marine Diesel Oil – (MDO) essentially a distillate fuel which may contain a small amount of residual component.

# Operations

## Health, Safety, Environmental protection

SOLAS Chapter VI Regulation 5-1 requires that a Material Safety Data Sheet (MSDS) for MARPOL Annex I type Cargoes and Marine Fuel Oils shall be provided to the ship by the supplier prior to loading or bunkering; this is to assist shipboard personnel in carrying out their duties under safe conditions. MSDSs might include the following warnings and guidance:

Fuel oil and vapours may:

- Ignite
- Cause dizziness and headaches
- Contain hydrogen sulphide which is highly poisonous
- Harm or cause irritation to skin
- Irritate the mouth and lungs

Precautions:

- Never enter an enclosed space not approved as safe for entry
- Stand to windward when opening tank lids or sampling points
- Use goggles
- Wear suitable gloves
- Wear suitable working protective clothing
- Change out of any oil-soaked clothing as soon as possible

Fire Precautions:

- Keep all bunker fuel away from naked flames, sparks or other sources of ignition
- Keep all bunker fuel away from heated surfaces

## Operations (cont.)

- Do not smoke on deck during bunkering operations
- Do not smoke near fuel tanks, or other locations where fuel vapours may be given off

### Safety and Environmental Protection:

- Know and use the appropriate Safety Management System checklists and procedures for bunkering, and if applicable, for Ship to Ship operations
- Know the ship's Shipboard Oil Pollution Emergency Plan (SOPEP) or Shipboard Marine Pollution Emergency Plan (SMPEP)
- Ship's oil spill equipment is to be ready and available in accordance with the SOPEP/SMPEP
- Ensure that proper lines and means of communication internally and externally are established prior to commencing operations, including particularly agreement on how ship stop or supplier stop instructions will be given, acknowledged and implemented
- Any spill in connection with a bunkering operation must immediately and in accordance with the SOPEP/SMPEP be reported to the appropriate bodies, including but not limited to:
  - o Port Authorities
  - o Port State Authorities
  - o Owners/Operators/Managers
  - o Ship's P&I Club
  - o Oil Spill Contractors/Qualified Individual, if applicable
  - o Ship's Flag State

### Planning for a bunkering operation

The following points should be covered in the on board procedures of the vessel however and are restated here for the sake of clarity.

## Operations (cont.)

Prior to bunkering the staff and crew involved must be aware of:

- The quantity and grades of fuel to be received.
- The method of delivery (pipeline, barge or road tanker).
- The tanks and pipeline systems on board that will be used during the operation,
- The order in which the tanks will be filled.
- The anticipated pumping rate and duration of the operation.
- Who will be responsible for each aspect of the bunkering.
- All involved should review the appropriate requirements of the vessel SMS and SOPEP or SMPEP.

### Monitoring and watch-keeping

As with all shipboard operations, monitoring of the operation and watch-keeping is to be carried out in accordance with the Safety Management System, Ship Security Plan and good seamanship taking into account the prevailing conditions on board and in the vicinity of the ship. There should be a minimum of one deck watch and one engine-room watch on duty at all times overseeing the:

- Safe access between shore or ship to ship
- Bunker transfer connection
- Bunker transfer progress (transfer rate, in order to avoid overfills, bunkers received versus capacity and agreed quantity to be received on board, estimated time of completion, etc.)
- Sampling

### Record keeping

All events and operations are to be carefully entered in both the Deck and Engine log books respectively and checks made that the appropriate entries in the Engine Room Oil Record Book are also made.

## Operations (cont.)

- Bunker system maintenance and testing
- Pre-arrival checklist
- Bunker loading plan
- Bunker start-up and completion times
- Sounding/ullage records
- Bunker measurement calculations
- Bunker tank gas readings
- Compliance with SMS, SSP, inclusive procedures and best practices
- Completed bunker checklists
- Record book entries (deck, engine and scrap log books)
- Oil record books
- All bunker-related communications and exchange of documents including:
  - Bunker Delivery Note (BDN)
  - Letters of Protest
  - Fact Sheets
  - Sounding reports and measurement calculations sheets
  - Bunker Quality certificates
  - Bunker receipts
  - Sample distribution and records should be carefully completed, checked, forwarded and filed as appropriate.

## Surveys

- Procedures In ports which are not in a state which is party to MARPOL Annex VI the suppliers sampling procedure may not be in accordance with that detailed below. The suppliers may chose to follow good practice as detailed below but this will be a matter controlled by the regulations in that port and the commercial agreement between the seller of the fuel and the buyer of the fuel. A continuous drip sample is to be taken throughout bunkering at the closest available sampling point to the receiving ship's bunkering connection/manifold agreed between the supplier's and receiver's representatives.
- The sampling equipment, including a sampling container, is to be checked for proper cleanliness and operation.
- Prior to commencement of bunkering, proper sealing of sampling container and needle valve are to be agreed upon and properly recorded.
- Sampling is to start simultaneously with the bunkering; if necessary, the needle valve must be adjusted to produce appropriate sample flow.
- If the sampling container is changed during bunkering, the new sampling container and needle valve must be re-sealed; all sample seal numbers must be recorded.
- Continuous checks of the sampling container and needle valve seals are to be carried out.
- After completion of bunkering, both the supplier's and receiver's representatives are to verify and witness the condition of the seals before breaking the seals.
- The sampling container is to be shaken in order to promote homogeneity of the sample.
- The sample is to be poured into 4 or 5 sample containers.
- Sample containers are to be sealed with uniquely-numbered seals.
- Sample labels are to be checked against the uniquely-numbered seals.
- Both the supplier's and receiver's representatives are to sign the sample labels.

## Surveys (cont.)

- Sample labels are to be pasted on the sample containers in the presence of the supplier's and receiver's representatives.
- All seal numbers are to be recorded on the sample labels and in the Bunker Delivery Note (BDN).
- The BDN is to be signed and countersigned by the supplier's and receiver's representatives respectively.

If the vessel is enrolled in a fuel testing programme additional samples will be required over and above the statutory samples; these additional seal numbers should also be included on the BDN. It is important to remember that in the event of a dispute the samples may be required as evidence in a court of law.

### Minimum information for a Sample label:

- Name and IMO number of the receiving ship
- Place or port of bunkering
- Name of bunker supplier
- Name of bunker carrier (barge, tanker, truck or installation)
- Grade of bunker fuel
- Date and time delivery commenced
- Sample method used to obtain representative sample
- Location at which sample was drawn
- Name and signature of the supplier's representative
- Name and signature of the receiver's representative
- Seal number (and also cross-checked with BDN)

### Caution

- Do not sign any sample seals or labels prior to completion of the bunkering

## Surveys (cont.)

- Do not sign extra seals or sample labels
- Do not sign as having received any samples without witnessing the origin of them
- **Always** re-check the condition of seals and recorded seal numbers prior to signing the BDN
- If the receiving ship is only provided with samples of unknown origin and/or samples which have not been witnessed, such samples and associated documents should be stamped and/or marked and/or signed "sample [or samples if more than one] origin unknown, signed without prejudice to acknowledge receipt only" and a letter of protest issued to that effect.
- The samples given to the vessel should be stored in a safe place and retained for a period (usually at least 3 months) before safe disposal. Individual vessel operators may require the samples to be retained for a longer period
- The requirements for the MARPOL sample are more stringent, these must be retained for a period of 1 year, either on board the vessel or at a location which is "under the ships control"

### Testing

It is common to have the supplied bunkers tested by an appropriate laboratory before use on board in order to be confident that the bunkers are within the agreed specifications and do not contain any substances that might diminish performance, increase wear and tear of the ship's engines or otherwise cause harm.

Laboratory testing is also used to ensure compliance in MARPOL Annex VI's Emission Control Areas and with local regulations requiring the use of low sulphur fuels. It is recommended that any indication of sulphur levels above 4.5 % or 1.0 % respectively should initiate a notification to the flag administration, bunker port administration and supplier according to the requirements of the IMO Port State Control Guidelines for MARPOL Annex VI as set out below:

The Port State Control Officer (PSCO) should check whether the quality of fuel oil used on board the ship conforms to the provisions of MARPOL Annex VI regulations 14 and 18\*, taking into account appendix IV to the Annex. Furthermore, the PSCO should pay atten-

## Surveys (cont.)

tion to the record required in regulation 14(6) in order to identify the sulphur content of fuel oil used while the ship is within SOx emission control areas, or that other equivalent approved means have been applied as required.

\*It should be noted that in the case where the bunker delivery note or representative sample as required by regulation VI/18 is not in compliance with the relevant requirements, the master or crew should have documented that fact. Where fuel oil supply was undertaken in a port under the jurisdiction of a Party to MARPOL Annex VI, the PSCO should report that non-compliance to the appropriate authority responsible for the registration of fuel oil suppliers in accordance with regulation VI/18(8)(a).

### Measurements and quantity

If possible, both the supplying ship's and receiving ship's designated fuel tanks for the bunkering operation should be measured and surveyed before commencement in order for supplier's and receiver's representative to agree upon the content and condition of the these tanks. If there is any disagreement related to the quantity, this should form a basis for issuing a letter of protest but it should be noted that suppliers' terms and conditions generally specifically disallow shipboard measurement in connection with any dispute as to quantity delivered.

The tank or tanks should be checked for water by water finding paste dipping or by using a tank bottom sampling device. The water paste if used in HFO, might indicate traces of water and should form the basis of a letter of protest.

### Be aware

Receiving ship's crew should be alert to the following malpractices:

- Shortening or lengthening of measuring tapes used by the supplier
- Falsified tank tables for the supplying tank or tanks
- Deliberately declaring incorrect densities and temperatures of the delivered fuel or fuels

## Surveys (cont.)

- Adding water; for example by using the supplying barge's fire-pumps or other service-pumps
- By adding air to the fuel, the so-called "cappuccino effect"

Other less sophisticated methods of reducing the quantity of bunker fuel delivered include unauthorised or concealed piping between the storage tanks and other un-nominated tanks, such as coffer dams or void spaces.

## Frequently Asked Questions (FAQ):

**What if the ship's calculations and measurements do not correspond to the supplier's figures on the bunker receipt?**

- Be sure to witness the measurements at the supplier's end of the delivery line wherever possible. Suppliers will normally only accept delivering barge/ship, tank-truck or shore-tank figures as conclusive.
- If the ship does not agree with the tank soundings, insist that they are re-taken again immediately.
- If the ship does not agree to the quantity calculations, sign only for the soundings and serve a note of protest in respect of the calculated volume.
- If the problem cannot be resolved appoint an independent surveyor to measure all barge and ship's tanks.

### **What is Density?**

Density is important in terms of quantity calculations and correct operation of the purifier; it is also an indicator of the energy and ignition quality of the fuel oil.

## Frequently Asked Questions (FAQ) (cont.):

- Density is the relationship between mass and volume at a given temperature and the unit is  $\text{kg/m}^3$ . The standard reference temperature used in international trade for density calculation of petroleum products is  $15^\circ\text{C}$ . Applying this density at  $15^\circ\text{C}$  to the volume gives the weight in vacuum.
- The relationship between density and weight factor in air for fuel oils is approximately  $1.1 \text{ kg/m}^3$ . To convert density at  $15^\circ\text{C}$  to the weight factor in air at  $15^\circ\text{C}$ ,  $1.1 \text{ kg/m}^3$  should be deducted.

### What if there is excess water content in bunker fuel?

The level of water in bunker fuel is normally low, about 0.1-0.2% by volume. The introduction of water can originate from a number of sources, including:

- Tank condensation
- Tank leakage
- Heating coil leakage
- Deliberate injection

Even though not a normal procedure, it is possible at least to obtain indications or traces of water in the delivered fuel by use of water paste; if water is detected, a letter of protest should be issued stating that traces of water in the fuel have been found. The actual amount of water present can normally only be established when the water has settled down at the bottom of the fuel tank, a day or so after delivery.

Normal levels of water in the fuel are usually drained from the ship's settling tanks with the remaining water being removed by the purifier and centrifuge. Most ship's can comfortably handle fuel oil with water content up to about 2% before the purifier.

### What is sulphur?

Sulphur is a naturally occurring element in crude oil; it becomes concentrated in the residual heavy fuel during the refining process. The concentration of sulphur in fuel oil depends primarily on the

## Frequently Asked Questions (FAQ): (cont.)

origin of the crude oil. On a worldwide scale the average sulphur level is in the range of 2-4% m/m (by mass).

### **What is fuel oil blending?**

Blending is a process for mixing two or more residual fuel oils and/or distillate fuel oils to achieve a specific end product defined typically by reference to ISO 8217, IFO and viscosity, sulphur content or other parameters. In practice, all bunker fuel is blended at one or more stages of its journey from refinery to ship, occasionally with material that is not suitable for use as bunker fuel; usually but not invariably, such contamination is uncovered by laboratory analysis of delivery samples.

### **What if fraud or attempted fraud is experienced?**

Any suspicion of fraud, provision of incorrect information or other irregularities should as a minimum, form a basis for issuing a letter of protest for each incident or irregularity to the supplier. Serious cases of suspected fraud or disagreement relating to the amount said by the supplier to have been delivered and believed by the ship to have been received should be reported to the ship's P&I Club.

### **What are "off spec" bunkers?**

Off spec bunkers are simply bunkers that are materially different from the contract specification.

# Final Words

The ship should advise the bunker purchaser of:

- the grade and quantity of bunkers needed safely to complete the planned next voyage
- the capacity of the fully segregated bunker tanks for storing the above bunkers upon arrival at the planned bunkering location
- the location of the ship's bunkering manifold and estimated height above the waterline and distance from the ship's side

Bunker purchasers should advise the ship of:

- the specification and quantity of bunker fuel stemmed (ordered) and
- Where, when and how the bunker fuel will be delivered.

Ships should take into account that:

- Bunkers from different suppliers should be segregated so far as practicable
- All bunker tanks should be gauged and the results recorded prior to and on completion of bunkering
- Documentation should not be signed before witnessing the actual event in respect of which the signature is requested
- Samples should be taken by the continuous-drip method throughout the bunkering
- If bunkers are supplied by more than one supplier, separate sets of samples should be taken of each bunker delivery
- The bunker delivery receipt should be signed only for the volume received if there is any doubt that the true density and/or temperature of the bunker fuel is not as stated.

## References to regulations and guidance:

- MARPOL Annex I - Regulations for the Prevention of Pollution by Oil
- MARPOL Annex VI - Prevention of Air Pollution from Ships.
- IMO MEPC.1/Circ.508 Bunker Delivery Note and Fuel Oil Sampling
- IMO Guidelines for the Sampling of Fuel Oil - Annex VI of MARPOL 73/78
- SOLAS Chapter VI Regulation 5.1 Material Safety Data Sheet
- OPA 90 - The Oil Pollution Act (OPA) US law adopted in August 1990
- EU Directive 2005/33/EC of the European Parliament and of the Council of 6 July 2005 amending Directive 1999/32/EC as regards the sulphur content of marine fuels
- ISGOTT Fifth Edition Chapter 25.4.3
- Ship to Ship Transfer Guide, ICS
- BIMCO Standard Bunker Contract
- BIMCO Bunker Clauses
- ISO 8217 Fuel Standard 2010

## IBIA – Aims of the Association

- To provide an international forum for bunker industry issues;
- To represent the industry in discussions and negotiations with national and international policy makers, legislators and other groups and bodies;
- To review, clarify, improve, develop and endorse where appropriate, industry methods, practices and documentation;
- To increase the professional understanding and competence of all who work in the industry;
- To provide services and facilities for members and others as the Board shall from time to time consider appropriate.



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## BIMCO – Reflecting Your Interests

BIMCO is an independent international shipping association comprised of ship owners, managers, brokers, agents and many other stakeholders with vested interests in the shipping industry. The association acts on behalf of its global membership to promote higher standards and greater harmony in regulatory matters. It is a catalyst for the development and promotion of a fair and equitable international shipping policy.

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