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Petroleum products — Procedures for the transfer of bunkers to vessels

Produits pétroliers — Procédures de transfert des soutes dans les navires

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, Subcommittee SC 2, *Measurement of petroleum and related products*.

This second edition cancels and replaces the first edition (ISO 13739:2010), which has been technically revised. The main changes compared with the previous edition are as follows:

— definitions of the verbal forms "shall", "should", "may" and "can" have been included in the Introduction;

— definitions of "list", "list correction", "supplier's representative", "trim" and "trim correction" have been added in Clause 3;

— the following terms have been replaced throughout the document:

  — "SHE" has been replaced by "HSE";

  — "cargo officer" has been replaced by "supplier's representative";

  — "note of protest" has been replaced by "letter of protest";

— 7.6 and Annex Q have been revised to include delivery by shore pipeline and road tankers;

— 11.5 has been updated to include a reference to MARPOL, Annex VI, Regulations 14.1, 14.4 and 18.3[31];

— a requirement to check for any leakages for filling lines has been included in A.5.4;

— units of measurements have been included in Annex H;

— a requirement to drain bunker tanker lines and hoses before opening and closing measurements has been included in J.3;

— the recording of secondary measurement has been included and the requirement on gauging and zero dip have been revised in J.4;

— a sample of a delivery time log has been included as a new Annex Q.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document was developed for the benefit of the marine industry, including ship owners, operators, charterers, bunker suppliers, bunker tanker operators and surveyors. It sets out a series of procedures to promote the uniform and expeditious transfer of bunkers to vessels meeting the latest health, safety and environmental (HSE) standards.

Local and international regulations, such as the International Maritime Organization (IMO) regulation *International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL), Annex VI: Prevention of Air Pollution from Ships*[31], apply to all parties involved in the transfer of bunkers.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates a permission;

— “can” indicates a possibility or capability.

Petroleum products — Procedures for the transfer of bunkers to vessels

WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

1 Scope

This document specifies procedures and requirements for the transfer of bunkers to vessels involving bunker tankers, road tankers and shore pipelines. It is applicable to pre-delivery, delivery and post-delivery checks and documentation.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4268, *Petroleum and liquid petroleum products — Temperature measurements — Manual methods*

ISO 8217, *Petroleum products — Fuels (class F) — Specifications of marine fuels*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
bunker
marine fuels comprising distillate fuels and/or residual fuels for a *vessel's* (3.23) consumption

3.2
bunker agreement
contractual terms applying to a *bunker* (3.1) transfer

3.3
bunker delivery note
BDN
official document from the *supplier* (3.19) providing information on the quantity of the *bunker(s)* (3.1) delivered to the *vessel* (3.23) and limited information on the quality

3.4
bunker surveyor
person engaged to survey the *bunker* (3.1) operation

3.5
bunker tanker
bunker barge or tanker used for the supply of *bunkers* (3.1) to the *vessel* (3.23)

3.6
bunker tanker operator
company that operates the *bunker tanker* (3.5)

3.7
cargo tank
tank containing *bunkers* (3.1)

3.8
chief engineer
person authorized to receive *bunkers* (3.1) and sign the associated documentation

3.9
list
inclination of a *vessel* (3.23) expressed in degrees port or starboard away from the vertical

3.10
list correction
correction to the observed tank measurement or observed quantity when a *vessel* (3.23) is *listing* (3.9), which can be applied provided that liquid is in contact with all bulkheads in the tank

Note 1 to entry: Correction for list may be made by reference to the vessel's list correction tables for each tank or by mathematical calculations.

3.11
nominated tank
tank from which *bunkers* (3.1) are delivered

3.12
non-cargo tank
tank not containing *bunkers* (3.1)

3.13
non-nominated tank
tank not nominated for current delivery

3.14
reference height
vertical distance that is noted on the tank capacity table, between the reference gauge point on the gauge hatch and the datum strike point on the tank floor or the gauge datum plate

3.15
road tanker
truck used for the supply of *bunkers* (3.1) to the *vessel* (3.23)

3.16
sample
bunker (3.1) specimen defined by time, location and method of sampling

3.17
sample seal
tamper-evident device that uniquely identifies the origin of the *sample* (3.16) and prevents the unauthorized loosening or removal of the sample container closure

3.18
shore pipeline
shore connection point for the supply of *bunkers* (3.1) to a *vessel* (3.23)

3.19
supplier
company whose name appears on the *bunker delivery note* (3.3)

Note 1 to entry: It is possible that the supplier is not the actual seller of the *bunkers* (3.1).

3.20
supplier's representative
individual who is appointed by the *supplier* (3.19) to be responsible for the delivery of *bunkers* (3.1) to the *vessel* (3.23) and for the completion of the documentation

3.21
trim
difference between the fore and aft draught of the *vessel* (3.23)

Note 1 to entry: When the aft draught is greater than the forward draught, the vessel is said to be trimmed by the stern. When the aft draught is less than the forward draught, the vessel is said to be trimmed by the head.

3.22
trim correction
correction applied to the observed gauge or observed quantity when a *vessel* (3.23) is not on an even keel, provided that the liquid is in contact with all bulkheads in the tank

Note 1 to entry: Correction for the *trim* (3.21) may be made by referencing trim tables for each tank or by mathematical calculation.

3.23
vessel
ship receiving *bunkers* (3.1)

4 Responsibilities

4.1 The supplier's representative shall:

a) provide an appropriate bunkering pre-delivery safety checklist depending on the mode of delivery (see Annexes C, D or E);

b) prepare the bunker requisition form (see Annex F) and confirm with the chief engineer the actual vessel requirements as stated on the requisition form;

c) prepare the non-cargo tank inspection form (see Annex G), as applicable;

d) prepare the cargo tanks measurement/calculation form (see Annex H), as applicable;

e) take samples in accordance with Annex L and prepare the sample labels (see Annex I);

f) prepare the BDN;

g) verify, sign and stamp the documents mentioned in a) to f).

4.2 The chief engineer shall:

a) prepare the vessel to receive bunkers;

b) confirm that the actual precautions and actions, as stated in the bunkering pre-delivery safety checklist (see Annexes C, D and E), have been taken by the vessel;

c) inspect and verify the non-cargo tank inspection form (see Annex G), as applicable;

d) inspect the measuring and sampling equipment for good service condition;

e) witness the opening and closing of tank gauges or flow meter readings and confirm the cargo tanks measurement/calculation form (see Annex H);

f) check the sample labels (see Annex I) upon completion of sampling (see Annex L);

g) check the BDN;

h) verify, sign and stamp the documents mentioned in b), c), e), f) and g).

4.3 The bunker surveyor(s), when engaged, shall:

a) identify themselves to the chief engineer and the master/supplier's representative;

b) conform to this document and, where applicable, any additional procedures set out by the authorities;

c) notify the supplier's representative and the chief engineer of any nonconformity to this document for immediate corrective action. Any nonconformity or irregularity found shall be reported to his/her principal in writing.

4.4 The master of the bunker tanker shall allow the bunker surveyor to board the bunker tanker.

4.5 The supplier's representative, the chief engineer and the bunker surveyor (when engaged) shall work closely together to ensure the procedures are conformed to and carried out safely and diligently at all times during the bunkering operation.

4.6 Bunker suppliers, bunker tanker operators, supplier's representatives, chief engineers, bunker surveyors and any other parties that have an interest in the bunker transaction shall not engage in any unethical practices. Any inducement to participate in such activities should be immediately reported to the appropriate authority and/or party.

5 Documentation

5.1 Documents supporting a transfer of bunkers to vessels involving bunker tankers, road tankers and shore pipelines will vary according to the requirements of local authorities, the law, suppliers and the vessel. Therefore, it is not practical to recommend standardized forms. However, for the accountability of duties, the minimum documentation for a bunker delivery includes the following:

a) for the bunker tanker delivery:

   1) safety checklist (see Annex C);

   2) bunker requisition form (see Annex F);

   3) non-cargo tank inspection form (see Annex G);

   4) cargo tanks measurement/calculation form (see Annex H);

   5) BDN (see 11.5);

   6) delivery time log form (see 11.6 and Annex Q);

   7) sample labels (see Annex I);

b) for the road tanker and/or shore pipeline delivery:

   1) safety checklist (see Annex D and/or Annex E);

   2) bunker requisition form (see Annex F);

3) bunker quantity measurement record;

4) BDN (see 11.5);

5) delivery time log form (see 11.6 and Annex Q);

6) sample labels (see Annex I).

5.2 Bunker suppliers shall have all these documents available. The documents shall bear the bunker supplier's name and, if applicable, a valid bunkering licence or registration number. Bunker suppliers shall issue documents for a bunker delivery that are consistent with this document and applicable international conventions. Bunker suppliers may have their own formats for these documents.

5.3 The completion of proper documentation is the joint responsibility of the supplier's representative, the chief engineer and the bunker surveyor (when engaged).

6 Bunker specifications

Unless otherwise agreed in the bunker agreement, the bunkers supplied shall be in accordance with ISO 8217.

7 Pre-delivery

7.1 Safety, health and environment

7.1.1 For the safe transfer of bunkers, the health, safety and environment (HSE) requirements given in Annex A shall be observed by all personnel involved in the delivery. Internationally accepted safety standards should also be observed.

7.1.2 The person in charge of the respective area(s) of bunker delivery operation shall remain at all times responsible for the safety of his/her crew, cargo and facilities, and should not allow safety to be prejudiced by the actions of others.

7.1.3 Methods for effective communication, emergency shutdown requirements given in A.3.5 and A.3.6, as well as hand signals shall be prearranged by the supplier's representative, the chief engineer and the bunker surveyor (when engaged) (see Annex B). A copy of the hand signal diagram shall be given to the chief engineer and the bunker surveyor (when engaged) prior to the commencement of the bunkering operation.

7.2 Pre-delivery documentation

The following pre-delivery documents, where applicable, shall be signed and stamped by the supplier's representative and the chief engineer when completed, except when otherwise stated by local regulations. These pre-delivery documents include:

a) bunkering pre-delivery safety checklist;

b) bunker requisition form;

c) non-cargo tanks inspection form for bunker tanker delivery;

d) cargo tanks measurement/calculation form.

These pre-delivery documents are intended to:

— record an agreement on operational details of the transfer;

— ensure the safe transfer of the product.

7.3 Bunkering pre-delivery safety checklist

7.3.1 A pre-delivery conference shall be conducted between the supplier's representative, the chief engineer and the bunker surveyor (when engaged). Such a conference shall include HSE checks, a review of the pre-delivery safety checklist and the establishment of communication links. A bunker pre-delivery safety checklist (see Annexes C, D and E) shall be completed, signed and stamped by the supplier's representative and chief engineer, with their names clearly printed.

7.3.2 Any amendment to this checklist shall be signed by the supplier's representative and the chief engineer.

7.3.3 The original of the completed checklist shall be retained by the supplier's representative and the duplicate shall be given to the chief engineer.

7.4 Bunker requisition

7.4.1 The supplier's representative shall inform the chief engineer of:

a) nominated quantity and grade(s) to be supplied;

b) delivery sequence and pumping rate;

c) sampling equipment to be used (see Annex K);

d) witnessing of the measurement procedure and sampling procedure (see Annex L);

e) line clearing requirements.

7.4.2 The requirements listed in 7.4.1 are given in the bunker requisition form (see Annex F). Any amendment to this form shall be signed by the supplier's representative and the chief engineer.

7.4.3 The original of the completed form(s) shall be retained by the supplier's representative and the duplicate(s) shall be given to the chief engineer.

7.5 Non-cargo tanks inspection for bunker tanker delivery

7.5.1 The supplier's representative and the chief engineer shall witness the measurement of non-cargo tanks and shall inspect the void spaces (see Annex G). If the chief engineer does not attend the inspection, the supplier's representative shall record this on the form. This shall be endorsed by the chief engineer.

7.5.2 Any amendment to this form shall be signed by the supplier's representative and the chief engineer.

7.5.3 The original of the completed form(s) shall be retained by the supplier's representative and the duplicate(s) shall be given to the chief engineer.

7.6 Cargo tank measurement/calculation

7.6.1 For bunker tanker delivery, the tank measurement/calculation form is used to record tank gauging and/or meter readings, cargo temperature readings and quantity calculations. This form should contain the information given in Annex H and shall be used by the supplier's representative to record

the calculation of the quantity in the tanks. The relevant API/ASTM/IP/ISO methods for gauging and measurement of petroleum and petroleum products should be used (see the Bibliography).

The supplier's representative shall invite the chief engineer to witness the opening gauge (or meter reading) and the taking of the cargo temperature of all cargo tanks. The chief engineer should witness the (remote) tank gauging of all the cargo tanks before the commencement of the pumping operation. If the chief engineer declines the invitation, the supplier's representative shall record this on the form and this shall be endorsed by the chief engineer.

The manual tank gauging procedure for bunker tanker deliveries shall be as given in Annex J.

If a flowmeter is used, it shall be calibrated, certified and sealed. The flow meter shall also be proven or verified, and this should be done in accordance with applicable industry standards (examples are included in Bibliography). A copy of the certificate shall be available for verification.

7.6.2 For shore pipeline delivery, the supplier's representative shall invite the chief engineer to witness the opening gauge (or meter reading) and the taking of the cargo temperature of all the cargo tanks. The chief engineer should witness the (remote) tank gauging of all the cargo tanks before the commencement of the pumping operation. If the chief engineer declines the invitation, the supplier's representative shall record this on the form. This shall be endorsed by the chief engineer.

7.6.3 For road tanker delivery, the supplier's representative shall invite the chief engineer to witness the opening gauge (or meter reading) or present the weighbridge ticket that shows the quantity that is delivered. Where applicable, the supplier's representative shall invite the chief engineer to witness the breaking of all the seals on the road tanker related to the certificate of delivery. Upon completion of the delivery, the supplier's representative shall invite the chief engineer to perform the tank empty inspection.

7.6.4 All documentation required by 7.6 shall be completed, signed and stamped by the supplier's representative and the chief engineer with their names, date and time of signing clearly printed (see Annex H).

7.6.5 Any amendment to this form shall be signed by the supplier's representative and the chief engineer.

7.6.6 The original of the completed form(s) shall be retained by the supplier's representative and the duplicate(s) shall be given to the chief engineer.

8 During delivery

8.1 General

8.1.1 Once the pre-delivery requirements have been completed and the bunker hose(s) has/have been properly connected, the bunkering operation shall commence after confirmation by the chief engineer.

8.1.2 The supplier's representative and the chief engineer are responsible for the entire bunkering operation, including the sampling process.

8.1.3 Communication between the supplier's representative and the vessel shall be maintained throughout the entire bunkering operation.

8.1.4 The supplier's representative and the chief engineer shall agree on the pumping rate, but in no case shall the agreed rate exceed the safe working pressure.

8.1.5 When an order to stop pumping is given by the vessel, the supplier's representative shall stop the pumping immediately.

8.1.6 All stoppages, shutdowns and suspensions, along with the reason for the action, shall be recorded in the delivery time log form.

8.1.7 Details of any delays shall be recorded in a letter of protest or statement of fact.

8.2 Bunker tanker delivery requirements

8.2.1 During the entire bunkering process, no other bunker tanker shall be allowed to come alongside the bunker tanker delivering the bunker(s) to the vessel, unless previously agreed by the supplier's representative and the chief engineer.

8.2.2 Onboard the bunker tanker, no inter-tank transfers except for stripping from the nominated tanks shall be carried out during the bunkering operation.

8.2.3 If the chief engineer has disallowed the clearing of the bunker hose content into the vessel's tank, the content in the hose(s) shall be drained back into the bunker tanker after the pumping operation is completed and before the final gauging is taken. This should be recorded in the statement of fact issued by the supplier's representative or the bunker surveyor (when engaged).

8.2.4 If the chief engineer has confirmed his/her acceptance of the line clearing process, the bunker hose content shall be cleared (when possible) into the vessel's tank, after the pumping operation is completed. The following shall apply.

a) The supplier's representative shall notify and confirm with the chief engineer, prior to the commencement of operation, that the vessel has sufficient tank ullage for safe line clearing.

b) The supplier's representative will close the discharge valve after the pump to build up the air pressure in the pipeline within the safe operating limits, by using the bunker tanker's pump.

c) Once the pressure is built up, the supplier's representative will open the discharge valve for the remaining bunkers in the bunker hose(s) to be cleared into the vessel's tank.

d) The line clearing process shall only be carried out after the pumping operation is completed. It shall not be repeated more than twice and shall not cause excessive air to be introduced into the bunkers in the vessel's tank(s).

e) Once the line clearing process is completed, the residue contents in the hose(s) shall be drained back into the bunker tanker before the final gauging is taken.

f) Compressed air shall not be used by the bunker tanker for the line clearing process.

8.2.5 Post-delivery checks and documentation shall commence after the line clearing process and/or the drain back process.

9 Sampling

9.1 General

9.1.1 The objective is to obtain a single representative sample of the delivered bunker.

9.1.2 The taking of the sample shall be witnessed by the supplier's representative, the chief engineer and the bunker surveyor (when engaged). The location of the sampler and method of sampling shall

be recorded on the bunker requisition form and signed by the supplier's representative and the chief engineer.

9.1.3 If a delivery is made from more than one bunker tanker, separate samples shall be drawn for each delivery.

9.2 Sampling procedure and equipment

9.2.1 The sampling procedure is given in Annex L.

9.2.2 A single sample should be jointly drawn continuously throughout the delivery, using a sampling device at the receiving vessel's inlet bunker manifold, see Annex VI of MARPOL[31], unless otherwise specified by the authorities having jurisdiction. Samples may also be taken from the bunker tanker outlet manifold in the event that there is an agreement between all parties concerned. Automatic samplers and continuous drip sampling devices are described in Annex M. It is recommended that the commercial samples and the MARPOL sample be derived from this single sample.

9.2.3 All bunker deliveries shall conform to the sampling equipment requirements given in Annex K, except for delivery from a road tanker, which is specified in 9.2.5.

9.2.4 If the sampling equipment provided by the bunker tanker or shore supply location differs from those given in Annex K, the chief engineer shall make comments in the remarks section of the bunker requisition form.

9.2.5 For road tanker delivery, truck loading samples are common industry practice and may be designated as the representative samples for the delivery. The source of the sample shall be recorded in the bunker requisition form and signed by the supplier's representative and the chief engineer.

10 Quantity measurements

10.1 All equipment relating to measurement as well as to the tank calibration tables should be subject to the requirements of applicable international standards and their accuracy should be verified according to a regular maintenance programme.

10.2 For delivery by bunker tanker, the measurements of quantity shall be determined by tank gauging or flowmeter onboard the bunker tanker. The manual tank gauging procedure is given in Annex J.

10.3 For shore pipeline delivery, the measurements of quantity shall be determined by automatic or manual gauging or flowmeter on shore.

10.4 For delivery by road tanker, proficient means shall be provided to determine the quantity delivered to the receiving vessel (e.g. certified weighbridge, flowmeter).

NOTE Flowmeters can be situated in pipelines from a tank farm or can be fitted on road tankers.

10.5 The supplier's representative shall use the latest tank calibration tables, including trim and list corrections, certified by a recognized, competent third-party for the calculations of quantity.

10.6 The delivered quantity shall be based on the out-turn quantity of the delivering facility and measurements/readings and calculations witnessed by the supplier's representative and the chief engineer. The chief engineer shall verify the quantity stated on the BDN to be in accordance with the calculations.

10.7 In the event of a quantity dispute, the party making the claim shall issue a letter of protest, which shall be signed for receipt by the other party (see Annex P).

11 Post-delivery

11.1 Post-delivery documentation

The following post-delivery documents, where applicable, shall be signed by the supplier's representative and the chief engineer, when completed to their satisfaction:

a) cargo tanks measurement/calculation form (see Annex H);

b) non-cargo tanks inspection form for bunker tanker delivery (see Annex G);

c) sample labels (see Annex I);

d) BDN (see 11.5).

11.2 Cargo tanks measurement/calculation form

The procedure specified in 7.6 shall be carried out to determine the delivered quantity. The tank gauging procedure shall be as given in Annex J.

11.3 Non-cargo tanks inspection form for bunker tanker delivery

In case of a dispute, the supplier's representative, the chief engineer and the bunker surveyor (when engaged) shall inspect and verify the contents and measurements of the non-cargo tanks. The appropriate post-delivery section of the non-cargo tanks inspection form (see Annex G, Part II) shall be completed and signed off by both parties.

11.4 Sample labels

Upon completion of the bunkering and sampling operations, sample labels (see Annex I) shall be completed and pasted immediately on the respective sample bottles, in the presence of the chief engineer and bunker surveyor (when engaged). The supplier's representative and the chief engineer shall sign and stamp the sample labels. No sample labels shall be presented to the chief engineer for signature prior to the completion of the bunkering and sampling operations.

The sample labels shall be prepared by the supplier's representative and shall contain at least the following information:

a) name of vessel and IMO number;

b) date of sampling;

c) port/location;

d) supplier;

e) supply source (name of bunker tanker/shore terminal or road tanker number);

f) sampling point;

g) sampling method;

h) quantity and grade of the product;

i) names and signatures of the supplier's representative, the chief engineer and the bunker surveyor (when engaged);

j) supplier's seal number and counter seal number (if applicable).

11.5 Bunker delivery note

A BDN shall be used for each individual bunker delivery. For multiple deliveries by bunker tanker, a separate BDN will be issued for each bunker tanker delivery, whereas for multiple road tanker deliveries, only one BDN needs to be issued.

While every supplier will have their own format for the BDN, it shall be prepared by the supplier's representative and shall contain at least the following information:

a) name of receiving vessel;

b) IMO number of the receiving vessel;

c) date and time of the commencement and completion of the delivery;

d) name, address and telephone number of the bunker supplier;

e) bunker specification (grade name);

f) quantity in tonnes (to indicate in air or in vacuum);

g) density at 15 °C, as supplied;

h) viscosity at 40 °C or 50 °C, as supplied;

i) sulfur content, as supplied;

j) a declaration signed and certified by the bunker supplier's representative that "The bunker(s) supplied is/are in compliance with Regulation 14.1 or 14.4 and Regulation 18.3 of MARPOL Annex VI";

k) a record of the supplier's sample seal numbers and any counter seal numbers on the sample;

l) delivery port;

m) bunker tanker name, road tanker identification number or name of supplying terminal;

n) next port of call;

o) receiving vessel's stamp and signature of the master/chief engineer;

p) signature and, where applicable, stamp from the supplier's representative;

q) section for comments.

Regulations for the prevention of air pollution from ships in Annex VI of MARPOL[31] require the BDN to be stored onboard the vessel for a minimum of three years.

At least two copies of the completed BDN shall be signed by the supplier's representative and the chief engineer, with their names clearly printed and stamped with the bunker tanker/terminal/road tanker's stamp and vessel's stamp.

Any cancellation or amendment on the BDN shall be endorsed and stamped by the supplier's representative and the chief engineer.

11.6 Delivery time log form

The delivery time log form (see Annex Q) shall be prepared by the supplier's representative and shall contain at least the following information, where applicable:

a) location of the delivery;

b) name of the supplier;

c) grade of the bunker;

d) name of the bunker tanker and IMO number;

e) road tanker number/name of shore terminal;

f) name of the receiving vessel and IMO number;

g) date and time of:

   1) coming alongside of the bunker tanker or road tanker;

   2) arrival and departure of the bunker surveyor (when engaged);

   3) connection of the hose;

   4) opening and closing measurements;

   5) commencement of pumping;

   6) any stoppages, shutdowns and suspensions;

   7) completion of pumping;

   8) disconnection of hose;

   9) departure of the bunker tanker or road tanker.

h) signature and stamp of the master/chief engineer of the receiving vessel;

i) signature and stamp of the supplier's representative;

j) signature and stamp of the bunker surveyor (when engaged).

12 Other requirements

12.1 Stock movement logbook

12.1.1 For bunker tanker delivery, the bunker tanker shall keep and maintain a stock movement logbook. Every page of the logbook shall be serially numbered, and each page shall be for a day's entries. Any cancelled pages shall be crossed out and retained in the logbook. The logbook shall be properly bound to prevent the removal of any page.

12.1.2 The daily entries of the stock movement logbook shall contain at least the following:

a) date and time of receipts and deliveries;

b) product grade, quantity, tank numbers and source of receipts;

c) product grade, quantity, tank numbers and destination of deliveries;

d) description of documents evidencing receipts and/or deliveries;

e) records of blending/inter-tank transfers;

f) summary of the stock movement;

g) name and signature of the person preparing the daily entries.

12.1.3 The supplier's representative shall maintain the daily entries of the logbook. If there is no activity of the bunker tanker on a particular day, the supplier's representative shall record so in the logbook.

12.1.4 Every stock movement of the bunker tanker, except for inter-tank transfers, shall be supported by a document duly executed and endorsed by the party concerned. The document reference shall be recorded accordingly in the logbook.

12.1.5 The supplier's representative shall prepare the daily entries and sign the logbook with his/her name clearly stated within two hours of any stock movement.

12.1.6 The stock movement logbook shall be kept onboard the bunker tanker for a minimum period of three months, calculating from the current date, and shall be made available to the local authorities on request.

12.1.7 In the event of a quantity dispute, the relevant pages of the stock movement logbook, showing all the stock movements related to the bunker delivery, shall be made available for inspection and photocopying by the local authorities, the chief engineer and/or the bunker surveyor (when engaged).

12.1.8 An example of the format of a stock movement logbook is shown in Annex O.

12.2 Plan of bunker tanker and diagram

The tank capacity plan, piping diagram, and trim and list tables shall be made available onboard for inspection.

12.3 Blending of products

12.3.1 When in-line or in-tank blending onboard the bunker tanker is carried out, the blended product shall be homogenous in accordance with the general requirements of ISO 8217.

12.3.2 To ensure a homogenous blend, the in-tank mixing of blend components onboard the bunker tanker shall not be carried out concurrently with the bunker delivery.

12.4 Letter of protest

The supplier's representative and/or the chief engineer may issue a letter of protest, containing full details and facts of any dispute related to the bunker delivery, which shall be signed for receipt by the other party (see Annex P). The bunker surveyor (when engaged) may also issue a statement of fact.

Annex A
(normative)

Health, safety and the environment

A.1 Pre-delivery conference

Prior to the commencement of the bunker delivery, a pre-delivery conference shall be conducted between the supplier's representative, the chief engineer and the bunker surveyor (when engaged).

A.2 Planning for safety

A.2.1 Firefighting

The supplier's representative and the chief engineer shall ensure that firefighting equipment is ready for immediate use during the bunker delivery.

A.2.2 Emergency preparedness

Emergency preparedness shall include regular drills, simulating various emergency scenarios that can occur during the bunkering operation. These scenarios shall be part of both the bunker tanker's and vessel's approved contingency plans. Such drills, when carried out, shall be documented.

A.2.3 Safety of crew

All members involved in the bunkering operation shall be properly rested. Members shall not use any substance (e.g. alcohol and drugs) that negatively influences their performance. They shall also be trained in the use of, and provided with, appropriate personal protective equipment.

A.2.4 Bunkering pre-delivery safety checklist

The safety checklist for bunkering operations (see Annexes C, D and E) shall be presented by the supplier's representative to the chief engineer at the pre-delivery conference. The safety checklist is an essential reminder of the principal safety factors and shall be supplemented by continuous vigilance during the entire bunkering operation. This will assist in adherence to the relevant safety procedures of a bunkering operation.

A.3 Observing safe work practices

A.3.1 Smoking and naked lights

Any regulations regarding smoking and the use of naked lights shall be strictly enforced. Warning notices shall be clearly and appropriately displayed.

A.3.2 Safe access

For the transfer of personnel, the vessel shall provide an accommodation ladder or access, see *International Convention for the Safety of Life at Sea (SOLAS), 1974*.[32] The access shall be properly rigged and illuminated. Personnel shall use only the designated means of access between the supplier's facilities and the vessel.

A.3.3 Outboard deckway

Personnel shall be reminded to walk on the outboard side of the bunker tanker to avoid falling objects from vessels, such as lashing materials.

A.3.4 Unauthorized craft

No unauthorized craft shall be allowed alongside the bunker tanker or the vessel throughout the bunkering operation.

A.3.5 General communication

A.3.5.1 Good communication among all members involved in the bunkering operation is an essential requirement for successful bunkering operations. A common language for communication shall be prearranged before bunkering operations commence.

A.3.5.2 Verbal and/or non-verbal communication shall be established between the parties. These may include radio or hand signals (see Annex B).

A.3.5.3 An emergency signal in the form of a horn and/or hand signals shall be prearranged and established. In the event of a breakdown of communications, the emergency signal shall be initiated and all operations immediately suspended.

A.3.5.4 Bunkering operations shall not resume until satisfactory communications have been re-established.

A.3.6 Emergency shutdown

A.3.6.1 Anyone observing a potential emergency situation or an unsafe condition shall immediately alert any member involved in the bunkering operation, who shall evaluate the situation and, if necessary, initiate an emergency shutdown.

A.3.6.2 The bunkering operations shall remain suspended until the supplier's representative, the chief engineer, and/or, where applicable, the authorities have agreed that it is safe to resume.

A.4 Preventing exposure to health hazards

A.4.1 Hydrogen sulfide

A.4.1.1 Hydrogen sulfide (H_2S) is a very dangerous, toxic, explosive, colourless and transparent gas, which can be found in marine residual fuels. H_2S can be formed during the manufacture of the fuel at the refinery or during handling and storage.

A.4.1.2 At very low concentrations, the gas has the characteristic smell of rotten eggs. However, at higher concentrations, it causes a loss of smell, headaches and dizziness, and at very high concentrations, instantaneous death.

A.4.1.3 Vapours containing H_2S can accumulate during storage or transport and can be vented during the filling of tanks. Exposure to H_2S vapours can occur when dipping tanks, opening tank hatch covers, entering empty tanks and from vent/vent pipes when tanks are being heated. Personnel on duty should refer to the information and instructions in the safety data sheet.

A.4.1.4 Personnel involved in the loading and transfer of bunkers shall be made aware of the hazards of vapour-phase H_2S and have in place appropriate processes and procedures to manage the risk of

exposure. Personal H_2S monitors and appropriate respiratory protection should be considered, as appropriate.

A.4.2 Enclosed and confined spaces

All bunker tankers shall be equipped with at least two (2) units of O_2 personal detectors and these detectors shall be worn by bunker tanker personnel before entering any enclosed or confined space. Refer to Annex C.

A.4.3 Accommodation openings

In order to prevent oil vapours from entering the accommodation area, all access doors to the accommodation shall be kept closed during the bunkering operation. All doors opened for personnel transit shall be closed immediately after use. The air conditioning system for the accommodation should be switched to the re-circulation mode.

A.4.4 Safety data sheet

A.4.4.1 A safety data sheet (SDS) provides the information necessary for customers, bunker tanker operators, emergency workers and others to decide on the appropriate handling and management of petroleum products.

A.4.4.2 The supplier's representative shall provide the chief engineer with a copy of the SDS for the bunkers to be supplied.

A.5 Protection of the marine environment

A.5.1 Oil spill response equipment

Oil spill response equipment shall be ready for immediate use on the bunker tanker and the vessel at all times.

A.5.2 Scuppers

In order to prevent oil spilling into the waters, all scuppers/drains on the bunker tanker and the vessel shall be properly plugged prior to the bunkering operation. Any accumulation of oil-free water shall be drained off periodically.

A.5.3 Oil spill

In the event of any spillage causing or likely to cause pollution, the masters of the bunker tanker and the vessel, regardless of which party is responsible, shall immediately take appropriate action to stop, contain and clean up.

A.5.4 Filling lines

All filling lines between the bunker tanker and the vessel should be checked to ensure they are not leaking during the bunker transfer.

Annex B
(informative)

Examples of hand signals for bunkering protocol

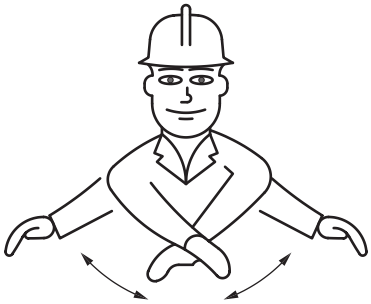
a) Wait/hold

b) Start

c) Reduce pumping rate

d) Increase pumping rate

e) Stop



f) Finish

Figure B.1 — Hand signals for bunkering

Annex C
(informative)

Example of a bunker tanker pre-delivery safety checklist

Vessel's name: _____ Bunker tanker's name: _____

Vessel's IMO No.: _____ Port: _____

Vessel's location: _____ Date: _____

All items should be confirmed by the supplier's representative and the chief engineer by checking the appropriate box. A copy of the completed checklist should be retained by both the bunker tanker and the vessel.

No.	Items to be checked	Bunker tanker		Vessel		Remarks
		Yes	No	Yes	No	
1	Have you checked the fendering system?					
2	Are you securely moored?					
3	Are you ready to move under your own power?					
4	Has the bunker requisition form been completed?					
5	Will the bunker tanks be monitored at regular intervals?					
6	Are transfer hoses in good condition, properly rigged with all flange holes fully bolted?					
7	Will personnel be in constant attendance at the bunker stations during the delivery?					
8	Are all bunker tank lids closed?					
9	Are unused connections blanked?					
10	Are required delivery warning notices in position?					
11	Are all personnel involved in the bunkering operations using appropriate personal protective equipment (e.g. H_2S monitor)?					
12	Are restrictions on smoking and the use of naked flames being observed?					

No.	Items to be checked	Bunker tanker		Vessel		Remarks
		Yes	No	Yes	No	
13	Is firefighting equipment positioned and ready for immediate use?					
14	Is emergency oil spill response equipment positioned adjacent to both hose connections?					
15	Are all external doors and port-holes in the accommodation closed?					
16	Are window type air conditioning units (where fitted) disconnected?					
17	Are air conditioning intakes closed to prevent the entry of vapours?					
18	Is effective communication between the bunker tanker and the vessel established?					
19	Have emergency signals and shut-down procedure been agreed on?					
20	Is there safe access between the bunker tanker and vessel?					
21	Are scuppers and drains onboard securely plugged?					
22	Is sufficient lighting available to perform operations during hours of darkness?					

Declaration

We, the undersigned, have covered all items on this checklist and have satisfied ourselves that the entries we have made are correct.

For the bunker tanker	For the vessel
Name:	Name:
Signature:	Signature:
Stamp:	Stamp:
Date: Time:	Date: Time:

Annex D
(informative)

Example of a shore pipeline pre-delivery safety checklist

Vessel's name: _____ Terminal/wharf: _____

Vessel's IMO No.: _____ Port: _____

Vessel's location: _____ Date: _____

All items should be confirmed by the supplier's representative and the chief engineer by checking the appropriate box. A copy of the completed checklist should be retained by both the terminal/wharf and the vessel.

No.	Items to be checked	Terminal/wharf		Vessel		Remarks
		Yes	No	Yes	No	
1	Have you checked the fendering system?					
2	Are you securely moored?					
3	Are you ready to move under your own power?					
4	Has the bunker requisition form been completed?					
5	Will bunker tanks be monitored at regular intervals?					
6	Are transfer hoses in good condition, properly rigged with all flange holes fully bolted?					
7	Is there electrical insulation in place between the terminal and vessel connection?					
8	Will personnel be in constant attendance at the bunker stations during the delivery?					
9	Are unused connections blanked?					
10	Are required delivery warning notices in position?					
11	Are all personnel involved in the bunkering operations using appropriate personal protective equipment (e.g. H_2S monitor)?					
12	Are restrictions on smoking and the use of naked flames being observed?					

No.	Items to be checked	Terminal/wharf		Vessel		Remarks
		Yes	No	Yes	No	
13	Is firefighting equipment positioned and ready for immediate use?					
14	Is emergency oil spill response equipment positioned adjacent to both hose connections?					
15	Is effective communication between the terminal/wharf and the vessel established?					
16	Have the emergency signals and shutdown procedure been agreed on?					
17	Are all external doors and portholes in the accommodation closed?					
18	Are air conditioning intakes closed to prevent the entry of vapours?					
19	Is there safe access between the terminal/wharf and vessel?					
20	Are scuppers and drains onboard securely plugged?					
21	Is sufficient lighting available to perform operations during hours of darkness?					

Declaration

We, the undersigned, have covered all items on this checklist and have satisfied ourselves that the entries we have made are correct.

For the terminal/wharf	For the vessel
Name:	Name:
Signature:	Signature:
Stamp:	Stamp:
Date: Time:	Date: Time:

Annex E
(informative)

Example of a road tanker pre-delivery safety checklist

Vessel's name: _____ Road tanker: _____

Vessel's IMO No.: _____ Port: _____

Vessel's location: _____ Date: _____

All items should be confirmed by the supplier's representative and the chief engineer by checking the appropriate box. A copy of the completed checklist should be retained by both the road tanker (RTW) and the vessel.

No.	Items to be checked	Road tanker		Vessel		Remarks
		Yes	No	Yes	No	
1	Have you checked the fendering system?	N/A	N/A			
2	Are you safely parked/securely moored?					
3	Are you ready to move under your own power?					
4	Has the bunker requisition form been completed?					
5	Will the bunker tanks be monitored at regular intervals?					
6	Are transfer hoses in good condition, properly rigged with all flange holes fully bolted?					
7	Will personnel be in constant attendance at the bunker stations during the delivery?					
8	Are unused connections blanked?					
9	Are required delivery warning notices in position?					
10	Are all personnel involved in the bunkering operations using appropriate personal protective equipment (e.g. H_2S monitor)?					
11	Are restrictions on smoking and the use of naked flames being observed?					
12	Is firefighting equipment positioned and ready for immediate use?					
N/A: Not applicable.						

No.	Items to be checked	Road tanker		Vessel		Remarks
		Yes	No	Yes	No	
13	Is emergency oil spill response equipment positioned adjacent to both hose connections?					
14	Are all external doors and port-holes in the accommodation closed?					
15	Are air conditioning intakes closed to prevent the entry of vapours?					
16	Is effective communication between the driver and the vessel established?					
17	Have emergency signals and shut-down procedure been agreed on?					
18	Is there safe access between the terminal/wharf and vessel?					
19	Are scuppers and drains onboard securely plugged?	N/A	N/A			
20	Is sufficient lighting available to perform operations during hours of darkness?					
N/A: Not applicable.						

Declaration

We, the undersigned, have covered all items on this checklist and have satisfied ourselves that the entries we have made are correct.

For the road tanker	For the vessel
Name:	Name:
Signature:	Signature:
Stamp:	Stamp:
Date: Time:	Date: Time:

Annex F
(informative)

Example of a bunker requisition form

BUNKER REQUISITION FORM

Bunker supplier's name

The chief engineer: _____ Date: _____

MV/SS: _____ Location: _____

We have been nominated to supply you with the following grade(s) of bunker:

_____ Tonnes marine fuel oil of ISO 8217 grade _____
_____ Tonnes marine fuel oil of ISO 8217 grade _____
_____ Tonnes marine diesel oil/gas oil of ISO 8217 grade _____
_____ Tonnes marine fuel oil as per agreed specifications _____

We undertake to supply you with the above grade(s) of bunker. Some basic characteristics of the bunkers are as follows:

Grade	**Kinematic viscosity** at 40 °C or 50 °C, mm^2/s	**Density** at 15 °C, kg/m^3	**Water content** % V/V	**Flash point** °C	**Sulfur content** %, m/m	**Pour point** °C	**Average delivery temp.** °C

The delivery sequence is as follows:

Grade	**Delivery sequence**	**Maximum line pressure** bar	**Supplier pumping rate** tonnes per hour	**Required receiving rate** tonnes per hour

1) Will you witness the opening and closing gauge of our tanks? Yes/ No/ N/A

2) Will you witness our meter readings? Yes/ No/ N/A

3) Will you witness sampling? Yes/ No

4) What method will be used for clearing hose content at the end of bunkering?

   i) Line clearing into the vessel's tank(s) and drain back.

   ii) Drain back.

5) Is the vessel equipped with scrubbers? Yes/ No

6) Location of sampling point

   Vessel manifold: Bunker tanker manifold: Other:

7) Sampling method:

   Continuous drip: Automatic: Other:

Remarks: _____

Prepared by: Acknowledged by:

_____ _____

Signature of the supplier's representative Signature of the chief engineer

Name in full (block letters): _____ Name in full (block letters): _____

Bunker tanker's/shore terminal's/ Vessel's stamp: _____

road tanker's stamp: _____

Date/time: _____ Date/time: _____

Name/signature of bunker surveyor (when engaged)/licence no.:

_____

Date/time: _____

*Please note that the stock movement logbook shall be made available to the chief engineer and bunker surveyor (when engaged).

N/A — Not applicable

Annex G
(informative)

Example of a non-cargo tanks inspection form for bunker tanker delivery

NON-CARGO TANKS INSPECTION FORM

PART I: PRE-DELIVERY

To: The chief engineer

MV/SS: _____

Date: _____

Location: _____

Name of bunker tanker: _____

Licence/IMO No. _____

We hereby declare the pre-bunkering measurements and contents of the non-cargo tanks on our bunker tanker as stated below. You are invited to witness the measurement of non-cargo tanks and inspect the void spaces.

Tank No./Compartment	Contents	Gauge ( )	Volume ( )	Remarks
Fore peak tank				
Aft peak tank				
Cofferdam				
Eng. fuel tank				
Ballast tank				
D/Bottom tank				
Other tank (specify)				

_____
Signature of supplier's representative

_____
Name in full (Block letters)

_____
Bunker tanker's stamp

_____
Date/Time

Witnessed by chief engineer YES/NO

Acknowledged by:

_____
Signature of chief engineer

_____
Name in full (Block letters)

_____
Vessel's stamp

_____
Date/Time

PART II: POST-DELIVERY

(To be completed and signed after bunkering operation, if requested by the chief engineer)

The following tanks/compartments were inspected

Tank No./Compartment	Contents	Gauge ( )	Volume ( )	Remarks
Fore peak tank				
Aft peak tank				
Cofferdam				
Eng. fuel tank				
Ballast tank				
D/Bottom tank				
Other tank (specify)				

Signature of supplier's representative

Name in full (Block letters)

Bunker tanker's stamp

Date/Time

Witnessed by chief engineer YES/NO

Acknowledged by:

Signature of chief engineer

Name in full (Block letters)

Vessel's stamp

Date/Time

Comments: _____

Annex H
(informative)

Example of a cargo tanks measurement/calculation form for bunker tanker delivery

CARGO TANKS MEASUREMENT/CALCULATION FORM Serial No. _____

Name of bunker tanker: _____ Name of vessel receiving bunkers: _____

All cargo tanks are gauged and witnessed: _____ Date: _____

(1a) Tank gauging — OPENING

Draft forward:			Trim:					Trim correction applied? Yes / No*	Sea state: Calm/Slight/Moderate/Rough		
Draft aft:			List °P/S					List correction applied? Yes / No*			
Tank No.	Grade	Temp. (°C)	Measured reference height (m)	Observed gauge (m)	Corrected gauge (m)	Total observed volume (TOV) (m^3)	Free water (m^3)	Gross observed volume (GOV) (m^3)	Density @ 15 °C (kg/m^3)	V.C.F. Table 54B	Gross standard volume (GSV) (m^3)

Note: Measured reference height equals to observed gauge height mentioned in API MPMS 3.1A.

(1b) Tank gauging — CLOSING

Draft forward:			Trim:					Trim correction applied? Yes / No*	Sea state: Calm/Slight/Moderate/Rough		
Draft aft:			List °P/S					List correction applied? Yes / No*			
Tank No.	Grade	Temp. (°C)	Measured reference height (m)	Observed gauge (m)	Corrected gauge (m)	Total observed volume (TOV) (m^3)	Free water (m^3)	Gross observed volume (GOV) (m^3)	Density @ 15 °C (kg/m^3)	V.C.F. Table 54B	Gross standard volume (GSV) (m^3)

(2) Meter reading (volumetric):

Grade	Average temp. (°C)	Totaliser opening (m^3)	Totaliser closing (m^3)	Indicated volume (IV) (m^3)	Meter factor	Density @ 15 °C (kg/m^3)	V.C.F. Table 54B	Gross standard volume (GSV) (m^3)

(3) Quantity delivered:

Density @ 15 °C (kg/m^3)	Gross standard volume (GSV) delivered (m^3)	W.C.F. Table 56	Tonnes (in air)

Valid certificate of verification available? Yes/No* _____

Weights and measures authority Seal No._____ _____Is seal intact? Yes/No*

Sampling container Seal No. _____ Needle valve Seal No._____

Remark (if any) _____

Opening gauges and cargo temperatures witnessed by chief engineer in the presence of supplier's representative	**Closing gauges and cargo temperatures witnessed by chief engineer in the presence of supplier's representative**
Signature of chief engineer:_____	Signature of chief engineer:_____
Name in full: _____ (Block letters)	Name in full: _____ (Block letters)
Date/Time:_____	Date/Time:_____
Vessel's stamp:_____	Vessel's stamp: _____
Signature of supplier's representative: _____	Signature of supplier's representative: _____
Name in full: _____ (Block letters)	Name in full: _____ (Block letters)
Date/Time: _____	Date/Time: _____
Bunker tanker's stamp: _____	Bunker tanker's stamp: _____

(* Delete as necessary)

Annex I
(informative)

Example of a sample label

Bunker sample label		
Vessel's name	IMO no.:	
Date	Port/location	
Supplier	Name of bunker tanker/ Terminal or road tanker's no.:	
Sampling point ☐ Vessel manifold	☐ Bunker tanker manifold	Other: _____
Sampling method: ☐ Continuous drip ☐ Automatic ☐ Other(s) _____ (detail)		
Grade:	Quantity (tonnes):	
Vessel's seal no.:	Supplier's seal no.:	Bunker surveyor's seal no.:
Chief engineer	Supplier's representative	Bunker surveyor (when engaged)
Name (block letters)	Name (block letters)	Name (block letters)
Signature	Signature	Signature
Stamp	Stamp	Stamp

Annex J
(normative)

Manual tank gauging procedure for bunker tanker delivery

J.1 Personnel involved with the gauging of bunker tanks shall conform to all the necessary safety, health and related emergency requirements pertaining to a bunkering operation as given in Annex A.

J.2 Every sounding pipe of the bunker tanker's cargo tank shall be clearly marked with the reference height in accordance with the bunker tanker's tank calibration tables. It shall be permanently displayed in a prominent position on the sounding pipe. For bunker tankers using other means of measurement, such as a dip stick, the reference height shall be marked accordingly.

J.3 Bunker tanker lines and hoses shall be drained before the opening and closing measurements. The supplier's representative and the chief engineer shall jointly witness and confirm the gauging of tanks, meter readings and cargo temperature readings of all cargo tanks of the bunker tanker before and after the delivery of bunkers. The chief engineer may use his/her own equipment to verify the readings. The readings shall be properly recorded in the cargo tanks measurement/calculation form as given in Annex H.

J.4 The following tank gauging procedure shall be observed by all parties concerned.

a) Every bunker tanker shall carry onboard appropriate measurement equipment. This should be done in accordance with ISO or equivalent standards (see the Bibliography).

b) The latest certified tank calibration tables, including trim and list corrections, shall be onboard and available for inspection.

c) The supplier's representative and the chief engineer shall jointly verify the reference heights of cargo tanks on the bunker tanker and check the measurement equipment before witnessing the gauging and cargo temperature measurements. Any difference between the observed reference height and the reference height shown on the tank calibration tables shall be recorded in a letter of protest and investigated before bunkering commences.

d) An oil-finding paste shall be used when gauging distillate fuel tanks. This is to determine the level of the product on the sounding tape accurately.

e) Manual gauging shall require obtaining either two consecutive gauge readings that are identical or three consecutive readings within an absolute range of 3 mm. When three readings are taken, all three readings shall be within the 3 mm range and shall be averaged.

   In the event that three gauges cannot be taken within a range of 3 mm because the cargo is moving, at least five readings shall be obtained in minimal time, recorded and then averaged. The soundings are to be taken as quickly as is practical and the immersion time of the bob/tape should be as brief as possible. Adverse conditions such as these shall be recorded.

f) Where secondary measurements using automatic tank gauging and an automatic thermometer are used, the readings shall be recorded before and after the transfer.

g) The trim and list of the bunker tanker are to be recorded and the corrections shall be applied accordingly, as specified in the trim/list correction tables.

h) Temperatures of both the nominated and non-nominated tanks shall be determined. The temperature measurement shall be taken concurrent with gauging. Temperatures shall be taken in accordance with ISO 4268.

i) A “0” reading on the sounding tape does not necessarily mean that the tank is completely empty. Zero reading shall be recorded as the volume stated in the tank calibration table. The use of trim and list correction is left to the discretion of the parties involved. The zero dip volume of the tank(s) shall be included in the bunker tanker calculations. This condition shall be deemed to apply when the closing gauge indicated no oil cut and the safe visual inspection of the bunker tanker cargo tank indicated free flowing oil at the aft of the tank.

   If the above condition exists, trim and list corrections shall not be applied to zero dip.

   To avoid zero dip volume application, sufficient bunkers should be retained in cargo tanks such that they touch all four sides of the tank.

j) All reference heights, soundings and cargo temperatures as witnessed by both parties shall be recorded on the tank measurement/calculation form.

k) The tank measurement/calculation form shall be completed and signed by the supplier’s representative and the chief engineer immediately after opening gauges and closing gauges are taken and agreed on.

J.5 It is recommended that for all grades of bunker(s), a water cut be taken by using water-finding paste. Where the product is fuel oil, preferably a water-finding rule should be used. If a bob is used, the bob should be washed with distillate fuel after the water cut is taken, in order to have an accurate reading of the water level.

Annex K
(normative)

Sampling equipment

The sampling equipment shall consist of the items listed in K.1 to K.5.

K.1 Sampling devices.

Based on the likely performance accuracy of sampling devices, the preferential order is:

a) flow-proportional automatic sampler;

b) time-proportional automatic sampler;

c) manual valve-setting continuous-drip sampler.

NOTE Use of the manual valve-setting continuous-drip sampler is recognized as common industry practice, albeit only the third listed preference. This acknowledges practical and economical considerations peculiar to the bunker industry.

K.2 Sampling container, weather-tight, having a capacity of at least 5 litres and capable of being security sealed.

K.3 Sample bottles, suitable for air transportation and long-term storage.

The bottle material shall not compromise the integrity of the sample. The sample bottle cap shall be designed to be tamper-proof, enabling it to be sealed and counter-sealed in a manner to prevent it from being prised off (see Annex N).

K.4 Sample labels, pre-printed, self-adhesive, tamper-proof and having a smear-proof surface, which can be written on. The label shall contain at least the text given in Annex I.

K.5 Seals, uniquely identifiable, preferably numbered in a consistent sequential order.

Annex L
(normative)

Sampling procedure

L.1 The procedure for bunker sampling shall be as given in L.2 to L.11. The sampling procedure is not suitable for the subsequent analysis of hydrogen sulphide and oxidation stability. The values of hydrogen sulphide and oxidation stability shall be stated in the certificate of quality issued by the cargo provider based on the samples taken at the cargo source. These two values shall be within the limits prescribed in ISO 8217.

L.2 Before the delivery of bunkers, the supplier's representative and the chief engineer shall inspect the sampling equipment as given in Annex K.

L.3 The supplier's representative and the chief engineer shall jointly ensure that the volume of the sample container is adequate to fill the number of sample bottles as agreed. They shall also ensure the sampling container is clean before fixing it to the end of the sampling probe.

L.4 After the supplier's representative and the chief engineer are satisfied that the sampling equipment meets the details given in Annex K, the sampling container shall be securely sealed in the presence of the supplier's representative and the chief engineer. The seal number shall be recorded on the tank measurement/calculation form (see Annexes H and I).

L.5 Where a continuous drip sampler is used, the supplier's representative and the chief engineer shall witness the setting of the needle valve on the sampling probe to ensure that a continuous-drip sample is collected throughout the entire duration of bunkering.

Unless otherwise agreed, the needle valve on the sampling probe shall be sealed in the presence of the chief engineer at the commencement of bunkering and the seal number recorded on the tank measurement/calculation form (see examples in Annexes H and I). Sampling shall start simultaneously with the commencement of the bunkering operation. When any adjustment of the needle valve is required, the supplier's representative and the chief engineer shall witness the adjustment and record the change of seal number.

L.6 Upon the completion of bunkering, the supplier's representative and the chief engineer shall confirm that the security seals of the sampling container and the needle valve are not tampered with.

L.7 After the supplier's representative and the chief engineer are satisfied with the sample collected in the sampling container, the sample shall be thoroughly shaken or stirred to promote homogeneity.

L.8 The sample is then poured in small, equal portions into at least four sample bottles, making three or four passes to fill each bottle in turn to obtain nominally identical samples. The minimum quantity in each sample bottle shall be 750 ml.

L.9 These sample bottles shall be distributed as follows:

a) two for the vessel, one of which is a MARPOL sample;

b) two retained by the bunker tanker (or terminal);

c) one for the bunker surveyor (when engaged);

d) one for fuel testing services, if required.

If the supplier's representative and the chief engineer agree that additional bottles should be filled from the sample, their distribution and seal numbers shall also be recorded.

L.10 All sample bottles shall be closed and sealed in the presence of the supplier's representative and the chief engineer. The seal numbers and, if used, counter seal numbers of all samples taken during this bunkering shall be recorded on the respective sample labels and on the BDN.

L.11 Upon completion of the bunkering and sampling operations, sample labels shall be completed, signed, stamped and pasted on the respective sample bottles by the supplier's representative and the chief engineer. No sample labels shall be signed and stamped prior to the completion of the bunkering and sampling operations.