

Vessels on Terminals - Release and Measurement of Products in Oil Tankers

Procedure

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

Technical Requirement: A provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

Recommended Practice: A provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

"This Standard is exclusive property of Petróleo Brasileiro S. A. - PETROBRAS, internal application and PETROBRAS Subsidiaries and shall be used by its suppliers of goods and services under contracts or similar under the conditions established in Bidding, Contract, Agreement or similar.

The use of this Standard by other companies / organizations / government agencies and individuals is the sole responsibility of the users.."

CONTEC

Comissão de Normalização
Técnica

SC - 40

Maritime Transportation of
Petroleum, Derivatives and
Bio-Fuels

Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard [N-1](#). For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

Foreword

This Standard is the English version (issued in 09/2013) of PETROBRAS N-2670 REV. C 09/2013. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

1 Scope

1.1 This Standard establishes criteria for inspection and acceptance of tanks in oil tankers in order to ensure the quantity and quality of the products to be handled.

1.2 This Standard establishes the required conditions to be enforced for measurements of liquid loads of oil, its derivatives and ethanol on loading/offloading operations on ships in terminals.

1.3 This Standard establishes the required conditions during initial, intermediate or final release on loading/offloading operations on ships in terminals.

1.4 This Standard establishes the required conditions for inspecting contracts on specialized technical services for inspection of product quantity and quality, in the loading and offloading operations of oil, its derivatives and ethanol, when transported by sea, lake or river.

1.5 This Standard applies to procedures started or revised as of its issuance date.

1.6 This Standard contains Technical Requirements and Recommended Practices.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

Portaria [ANP no. 80](#), de 30/04/1999 - Estabelece o Regulamento Técnico ANP nº 003/99, anexo a esta Portaria, que especifica os óleos combustíveis de origem nacional ou importados a serem comercializados em todo o território nacional;

Resolução [CNP no. 6](#), de 25/06/1970 - Tabelas de Correção das Densidades e dos Volumes dos Produtos de Petróleo;

[NR-33](#) - Segurança e Saúde no Trabalho em Espaços Confinados;

PETROBRAS [N-2673](#) - Embarcações em Terminais - Limpeza de Tanques;

PETROBRAS [N-2689](#) - Operação de Oleoduto Terrestre e Submarino;

PETROBRAS [N-2732](#) - Controle de Qualidade de Produtos e Petróleo;

API [MPMS 17.9](#) - Manual of Petroleum Measurement Standards - Chapter 17 - Marine Measurement - Section 9 - Vessel Experience Factor (VEF) IP Hydrocarbon Management HM 49;

ASTM [D4057](#) - Standard Practice for Manual Sampling of Petroleum and Petroleum Products;

ASTM [D1265](#) - Standard Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method;

ASTM [D3700](#) - Standard Practice for Obtaining LPG Samples Using a Floating Piston Cylinder;

[ISGOTT](#) - International Safety Guide for Oil Tankers and Terminal.

NOTE For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

3 Terms and Definitions

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

3.1

Vessel Experience Factor - VEF

established factor for a determined vessel which stems from the ratio between the quantities measured on shore tanks and those measured on the onboard tanks. The purpose of this factor is to correct the onboard quantity, and to be an auxiliary tool for checking the consistency of loading or offloading operations

3.2

GIAONT

Operational Monitoring and Inspection Group for Ships and Terminals

3.3

surveyor

independent companies, hired to provide quality and quantity inspection services on operations on ships or barges

3.4

Material Safety Data Sheet (MSDS)

contains information on transporting, handling, storing and disposal of chemicals, taking on account the aspects of safety, health and environment. Also known as the FISPQ (in Portuguese) of the product

3.5

tanker

ship built to transport oil and/or clear and dark derivatives

3.6

Load or Loading Operation (CG)

all previously scheduled operation, preferably of ethanol and oil and its derivatives, which purpose is to carry on board a specified quantity of load on the ships' tanks

3.7

Discharge or Offloading Operation (DG)

all previously scheduled operation, preferably of ethanol and oil and its derivatives, which purpose is to discharge a specified quantity from the ships' load tanks (in this category, the discharge of slop and/or oily residue are included)

3.8

Report of Onboard Quantities and Measurements (RMQB)

document which contains the records of measurements, calculations and comparison of the load quantities handled on board

3.9

slop tank

tank for receiving cleaning and other residue

3.10

ship terminal

port facilities at sea, lake or river for loading and offloading operations of vessels, including operations of anchored ships under the responsibility of the Terminal

3.11

Time Charter Party (TCP)

chartering contract of ships for a specific limited time

3.12

Time sheet (Time log)

form for registering occurrences

3.13

Ullage Temperature and Interface (UTI)

equipment for measuring temperature, ullage, innage and interface between water and oil

3.14

Total Calculated Volume - TCV

total volume of product, sediment and free water, corrected to the reference temperature (20°C in Brazil) through the volume correction factors depending on density for a standard temperature, a pressure correction temperature and others

4 General Conditions

This Section applies to ships for transporting of oil, dark and clear derivatives, and ethanol but chemical or gas tankers.

4.1 Control of Contamination of Products

4.1.1 Responsibility for the cleanliness and adequacy of the vessel's tanks, pumps and grids so they may support the scheduled load is exclusively of the ship. The terminal is in charge of cargo handling up to the manifold of the ship. However, the terminal shall evaluate compliance with PETROBRAS [N-2673](#), concerning the checking of the cleaning status of tanks and proceed as 4.3.3. In case there is contamination, the 3 involved parties (owner of the load, terminal and ship) shall check the causes and the responsibility.

4.1.2 Any contamination of the product shall be detected during loading and/or offloading operations, through quality control procedures of products and products handled.

4.1.3 The sample collecting procedures on the pier, on the manifold of the ship and on the 1st level of the load on the first receiving tank shall be performed to allow the determination of liability for potential contamination. PETROBRAS [N-2732](#) establishes the representative sample of the beginning of the onboard collected load when the product reaches 1m-high or 1 foot-high, from the first receiving tank or from the most critical tank according to the previous load plan.

NOTE To collect for analysis and to store the representative sample from the beginning of the ship's loading, i.e., the 1st meter or the 1st foot of linear height of product of the 1st tank to be loaded into the ship.

4.1.4 Whenever tests detect any contamination, to proceed as to the PETROBRAS [N-2732](#).

4.2 Tank inspection

4.2.1 Considering 4.1.1, and the sampling mechanisms and the tests performed in the terminals, the inside inspection of tanks shall be performed by certified personnel only on the following situations:

- a) loading of aviation kerosene (QAV);
- b) loading of lubricants;
- c) loading of clear products when the last load is a dark one;
- d) when the product selling contract requires such inspection;
- e) loading of products with more restrictive quality standards. Example: diesel S10;
- f) loading of ethanol.

NOTE The need of such inspections shall be confirmed by the Petrobras product quality area.

4.2.2 For scheduling under the situations listed in 4.2.1, the ship's representative shall be informed the ship shall arrive at the loading port with the tanks indicated for inspection in the "free for man" condition.

4.2.3 The inspection of the onboard tanks shall be carried out by an independent inspector, designated by Petrobras, and to be followed up by the terminal's representative.

4.2.4 The inspector shall enter the tanks due to loading for checking out the coating and cleaning conditions, and whether the piping and pumps are drained. The inspector shall comply with the safety procedures from [ISGOTT](#), [NR-33](#), and the specific ones of the ship.

4.2.5 All due procedures for quantitative inspections and determination of any leftovers on board shall be utilized.

4.3 Criteria for Acceptance and Rejection of Tanks

4.3.1 The tanks and their nets shall be fully dry and drained.

- a) QAV
 - tank coating shall be in good condition s (20% max corrosion on the tank's total area);
 - bulkheads, inner structures and bottom of tanks shall be clean and left with no visible residue;
 - the tank, including their grids, shall be left totally dry;
- b) lubes:
 - bulkheads, inner structures and bottom of tanks shall be clean and left with no visible residue;
 - the tank, including their grids, shall be left totally dry;

- c) clear product after dark product:
 - bulkheads, inner structures and bottom of tanks, including their grids, shall be clean and left with no visible residue;
 - tanks and respective grids shall be totally dry.
- d) ethanol after clear products:
 - bulkheads, inner structures and bottom of tanks, including their grids, shall be clean, freshened and left with no visible residue.

4.3.2 The terminal's representative shall not sign-off any tank inspection certificate issued by a third party as to the appropriate use of the tanks for loading.

4.3.3 For preventing undesirable delays should the ship's representative insist on the certificate sign-off for loading, a "ONLY RECEIVED" safeguard shall be issued.

4.3.4 The terminal's representative shall evaluate the information received from the ship about the 3 latest loads shipped in order to avoid product contamination. If the sequencing of the latest loads does not comply with the product to be operated, the terminal's representative shall inform the scheduling and state the reasons by issuing a letter of protest against the ship.

5 Release of Ship

5.1 The initial letter (Annex B) consists of a document which establishes the operational and safety conditions between the terminal and the ship for initial, transient and permanent regimes. This document includes the following information: onshore equipment and measurements (flow rate, pressure, arms and lines), the ship's contract terms and conditions, information about the trip, additional information and notes on operation and safety.

5.2 In order to ascertain the quantities on board and check the readiness of the ship in all aspects, the representatives of the ship and the terminal shall:

- a) hold an initial meeting (information exchange on load/offload procedures);
- b) perform an operational safety inspection of the ship ([ISGOTT](#));
- c) perform a reading of the fore draft, amidships draft and aft draft;
- d) receive documents and samples of the origin (loading/offloading);
- e) sign and deliver documents;
- f) measure product, water, temperature and sampling level, if any, inside the ship's tanks;
- g) calculate the quantities found on board;
- h) balance quantity between origin and destination.

NOTE If necessary, they can go together with an independent inspecting company or a representative of the Federal Internal Revenue.

5.3 On boarding, the terminal's representative, together with the GIAONT, shall contact the officer in charge of the information (first mate or master) about the ship, when the details of the operation to be performed shall be worked out. The representatives of the terminal and the ship shall previously get to know about the quantities and the characteristics of the products to be handled.

5.4 When applicable, all documents issued by the parties shall be signed and stamped by all.

NOTE 1 If the ship's representative refuses to receive any document, this shall be recorded on the back of the document, with sign-offs of 2 witnesses and handled to the ship's agent.

NOTE 2 If the terminal's representative refuses to receive any document, this shall be recorded on the back of the document, with sign-offs of 2 witnesses and delivered to the ship's agent.

NOTE 3 If the ship's agent refuses to receive the document of the terminal, this shall be reported to the person in charge of the ship's schedule.

NOTE 4 One can adopt a unique emitter for both the RMQB and timesheet, which is to be valid for the interested parties.

5.5 In the loading/off-loading operations, the ship's representative is to be in charge of the measurements and samplings of the inboard tanks, with calibrated, certified, and in good shape equipment. If the onboard equipment is not available, the terminal's representative shall provide it.

NOTE The terminal's representative shall supply all due paperwork for the clearance (forms, recipients, seals, labels etc).

5.6 For measurements in the tanks in the terminal, the terminal's representative shall invite the ship's representative for following up on the measurements of the products to be handled.

5.6.1 In order to perform such measurements, the operational safety recommendations provided in the [ISGOTT](#) shall be adopted as a basic safety rule, whether there is or there is not an inert gas system.

5.6.2 The measurements in the onboard tanks can be performed by automated instruments of the ship control panel, which shall have valid calibrations and certificates, in the following situations: **[Recommended Practice]**

- a) for operations in unsheltered terminals in which sea conditions are not favorable;
- b) for cabotage operations with own and chartered ships in TCP, carrying national oil directly from PETROBRAS' platforms.

5.6.3 Should there be any out-of-tolerance measurements as to items 8, 12 from this standard, one shall adopt measuring of the onboard tanks by either UTI probe or manual measuring tape under the ship's representative.

5.7 For measurements of fuel oil, the amount of water and sediment (BSW) which exceeds 1.0% in volume shall be deducted, as per the Portaria [ANP no. 80](#). In case of oil and other derivatives, the discounted shall be full.

5.8 Samples collected at any operational stage and the quality control procedures shall follow the requirements of either the ASTM [D4057](#) or the ASTM [D1265](#). For LPG, the requirements of the ASTM [D3700](#) shall be followed.

6 Initial Release on Loading

6.1 The initial letter (Annex B) consists of a document which establishes the operational and safety conditions between the terminal and the ship for initial, transient and permanent regimes. This document includes the following information: onshore equipment and measurements (flow rate, pressure, arms and lines), the ship's contract terms and conditions, information about the trip, additional information and notes on operation and safety.

6.2 When boarding the ship, the terminal's operator shall require from the ship's representative all the documents from the origin. Such documents comprise: measurement report of onboard tanks at the original port, product test certificate (for remaining product) after the last operation, existing amounts of bunker (diesel or fuel oil) and water for consumption of the ship after berthing, and other information deemed necessary for a desired operational efficiency.

NOTE Non-compliance by ship/terminal implies in the issuing of a letter-of-protest.

6.2.1 Initial release for loading consists in:

- a) measuring all load tanks which may contain residue and slop, measuring oil and free water, investigating possible remains;
- b) calculating the remaining volumes in ambient liters, in liters at 20°C, and masses in kilograms;
- c) completing, with the onboard representative, of the initial letter of operation;
- d) issuance of the RMQB document (see Annex A) as a record of measurements and their respective volumes;
- e) Operational Safety Checklist between ship and terminal ([ISGOTT](#)) prior to loading operation.

6.2.2 Prior to authorization for the beginning of the loading operation, the terminal's representative shall inquire the ship's representative about the documents described below, without which there is no "ready to operate" warranty from the ship. In case one of these documents is missing, loading shall not be authorized:

- a) notification of "ready to operate" for load "Notice for Readiness" (NOR);
- b) safe fuel declaration (flash point over 60 °C);
- c) loading plan prepared on board.

NOTE The ship/terminal shall report in writing any particularity which may impact measurements, operation, quality, and safety of loading.

6.3 The terminal's representative shall provide the ship's representative with the Material Safety Data Sheet (MSDS) as to the current legal requirements, which is available in the PETROBRAS HSE intranet portal, and product samples as to PETROBRAS [N-2732](#).

6.4 Whether or not there are load remains onboard, the terminal's representative shall issue the RMQB for recording measures and volumes found on board prior to loading. If the ship's representative shall not allow or facilitate the measurements, the terminal's representative shall issue the letter-of-protest.

6.5 For carrying out a loading operation in a tank with remaining, there must be a prior Petrobras' authorization. If approved, the terminal's representative must provide the test certificate of the total inboard volume for each product. The original invoice or fax must be provided and sent to the destiny terminal prior to the ship's arrival in order for the product to be offloaded.

6.6 Partially loaded tanks can be topped, provided they have been properly measured, and their volumes quantified and authorized by the schedulers. At the end of loading, there shall be recorded, on a specific RMQB board for handled amounts, the discount in volume at 20 °C from the Total Volume Onboard ("On Board Quantity"-OBQ) prior to loading, as to the formula below:

$$Bo = TCVb - OBQ$$

Where:

- Bo total inboard loaded volume and measured at 20 °C (original board);
- TCVb total inboard volume (product + free water + BSW) measured at 20 °C on board after loading ("Total Calculated Volume");
- OBQ total inboard volume (product + free water + BSW) measured at 20 °C on board prior to loading ("On-Board Quantity").

7 Initial Release at Offloading

7.1 When boarding, the terminal's representative shall require from the ship's representative: the measurement report of onboard tanks at the original port (prior to and after last operation), the amounts of existent bunker (diesel and fuel oil) and water for consumption of the ship after berthing, the original samples, MSDS of loads to be handled, test certificate (when applicable, adhering to PETROBRAS [N-2732](#)), notice of "ready to operate" for NOR load, safe fuel declaration (flash point over 60 °C), discharge plan prepared on board and other information deemed necessary for operational efficiency.

NOTE Non-compliance by the representatives of either the ship or the terminal in any of the mentioned items implies in the issuing of a letter-of-protest.

7.2 Initial release for offloading consists in:

- a) measuring all load tanks, slop tanks, cofferdam tanks and ballast tanks (on exceptional cases);
- b) calculating the volumes found in ambient liters at 20 °C and kg;
- c) completing, with the onboard representative, of the initial letter of operation;
- d) issuance of the RMQB document;
- e) operational safety checklist between ship and terminal ([ISGOTT](#)).

7.3 Prior to authorization for the beginning of the offloading operation, the terminal's representative shall inquire the ship's representative about the documents listed below, without which there is no "ready to operate" warranty from the ship. In case of one of the following documents is missing, offloading shall not be authorized:

- a) notification of "ready to operate" for load "Notice for Readiness" (NOR);
- b) safe fuel declaration (flash point over 60 °C);
- c) loading plan prepared on board;
- d) onboard amount and measurement report - RMQB (origin – prior to and after);
- e) a document which proves load ownership (bill of lading, load manifest or tax invoice);
- f) load test certificate;
- g) MSDS.

NOTE In case of any missing document, the terminal's representative shall issue a letter-of-protest, and register the problem for the PETROBRAS 'acknowledge.

7.4 The terminal's representative shall require from the ship's representative the samples from the product's origin. In case of non-compliance in the samples (unfit recipients, breached seals, lack of sign-offs, undue identification etc.), the terminal's representative shall issue a letter-of-protest, and register the non-compliances for the PETROBRAS 'acknowledge.

7.5 The ship's representative shall report in writing to the terminal's representative on any abnormality to impact on measurement and product quality.

8 Initial Measurement on Loading and Offloading

8.1 Measurements or soundings (ullage-empty space, innage - full space, temperature, load water, in all load tanks, including slop tanks and those tanks which shall not be handled) shall be performed by the ship's representative, monitored by the terminal's representative, and, if necessary, by the representatives of either the Federal Internal Revenue (Service) or the surveyor company.

NOTE For offloading, measurements of free water shall be carried out against the figures found at origin, and the destination figures shall be considered.

8.2 Temperature shall be measured in all tanks for allowing their volume correction as to 20°C.

8.3 If the ship has an inert gas system and does not have a closed measurement system, including a free water one, there shall be a sufficient and safe depressurization in charge of the ship's representative in order to perform measurements and samplings.

8.4 For comparing to the volumes loaded at the origin, the initial measurement prior to the offloading operation shall adopt the density at origin for a preliminary calculation. The final calculation shall adopt the density indicated in the onboard composite sample, taken preferably prior to offloading and analyzed by the lab of the terminal or at any other referred by it.

NOTE Confrontation between the quantities at 20 °C onboard and on shore for loading and offloading shall not exceed the limits indicated on 12.3.

8.5 For volume correction as to 20 °C, the correction factor to be adopted is that which corresponds to the temperature of each tank, obtained by the [CNP no. 6](#) Resolution tables or by others, provided the latter are approved and recognized by PETROBRAS.

8.6 After measurements are finished, the terminal's representative shall issue the RMQB as to the criteria adopted by the terminal (Annex A). Also to refer to the Control System of Operations and Stay of Ships (SISCOPE).

8.7 The acceptable differences between the onboard/onshore measurements, both for loading and for offloading, shall be acknowledged as to the VEF value. The VEF value shall be calculated according to the updated version of the API [MPMS 17.9](#), and be used for correcting (divider) the volumetric quantities measured on board. The "corrected onshore/onboard" differences shall be within the interval -0,3 % to +0,3 %, else the terminal's representative shall issue a "letter-of-protest" to the ship's representative.

8.7.1 On loading:

$$Bo = TCVb - OBQ \quad (1)$$

$$Boc = Bo / VEFc \quad (2)$$

$$-0.3 \% \leq (Boc - TCVt) * 100 / TCVt \leq +0.3 \% \quad (3)$$

Where:

Bo total loaded volume at 20 °C measured onboard (original board);
 TCVb total volume on board (product + free water + BSW) at 20 °C, measured on board after loading ("Total Calculated Volume");
 OBQ total volume on board (product + free water + BSW) at 20 °C, measured on board prior to loading ("On-Board Quantity");
 Boc total loaded volume at 20 °C measured onboard, and corrected by VEF (corrected original board);
 VEFc ship's experience factor, at loading;
 TCVt total volume at 20 °C shipped from the onshore tanks (product + free water + BSW).

8.7.2 On offloading:

$$Bd = TCVb - ROB \quad (1)$$

$$Bdc = Bd / VEFd \quad (2)$$

$$-0.3 \% \leq (Bd\ c - TCV\ t) * 100 / TCVt \leq +0.3 \% \text{ (see Note)} \quad (3)$$

Where:

Bd	total offloaded volume at 20°C measured onboard (destination board);
TCVb	total volume on board (product + free water + BSW) at 20°C, measured on board prior to offloading;
ROB	total volume on board (product + free water + BSW) at 20°C, measured on board after offloading ("Remaining On-Board");
Bdc	total offloaded volume at 20°C measured onboard, and corrected by VEF (corrected destination board);
VEFd	ship's experience factor, at offloading;
TCVt	total volume at 20°C received on the onshore tanks (product + free water + BSW).

NOTE If the ship does not have VEF, to use the tolerance interval -0,5 % and +0,5 %.

9 Intermediate Measurements

9.1 At the first hour of handling, the onshore and onboard volumes shall be compared, and the difference can be recorded as line filling, and the possibility that an operational abnormality might be happening shall not be discarded. After the first hour, measurements shall be taken at intervals not exceeding 1 hour and the volume change shall be monitored. Measurements of the receiver and sender of the handled and built-up volume shall be recorded on an appropriate form, which may indicate the possibility of operational abnormalities and significant differences throughout the transfer period.

9.2 If the differences happen to be off-limits for that ship, the operation shall be interrupted, an intermediate measurement shall be taken, and the causes of the abnormality shall be checked out.

NOTE To use the PETROBRAS [N-2689](#) as reference.

10 Final Measurement and Release at Loading

10.1 In the final measurements after loading operations, the weighted average densities from the samples taken in the onshore tanks or vessels of origin (in case of transfer) shall be adopted.

NOTE 1 When the terminal is not able to carry out the inboard composite sample analysis for the final measurements after the loading operations, the average weighted densities shall be utilized, which are to be obtained from either the samples of the onshore tanks or the ships at origin (for transshipping).

NOTE 2 For calculating the loaded volume, the remaining volume at 20 °C existent before loading shall be discounted from the total volume at 20 °C found inboard after loading.

10.2 Upon completion of loading, the ship's operator, together with the terminal's operator, shall perform the measurements in the inboard tanks for white and dark products, and free water as to the volume table of each inboard tank. The measurements shall be performed in all the ship inboard tank, slop ones included, and to register all the respective temperatures as to the RMQB (see Annex A). In the final liberation, the ship's representative shall report the existent inboard quantities of bunker and potable water. The terminal's representative shall register the volumes in the time log form.

NOTE 1 On measuring tanks, the ship's operator shall sample the tanks to have been loaded.

NOTE 2 The ship's operator shall observe the final draft at bow, amidships (Portside [BB] and Starboard [BE]) and stern, and record on the RMQB and on the time log.

10.3 The recordings of operational occurrences (time-sheet) and pressures shall be completed and ratified by the parties.

10.4 Either the representatives of the terminal or the ship shall issue letters-of-protest regarding the abnormality occurred involving the terminal/ship operations.

11 Final Measurement and Release at Offloading

11.1 Upon completion of the planned offloading and drainage, the terminal's operator shall monitor the measurements of possible remaining products in all the ship's tanks, including slop tanks, and to register their respective temperatures and amounts in the RMQB (see Annex A).

11.2 If the ship's representative happens neither to allow nor create the necessary conditions for their tanks to be inspected, the terminal's representative shall issue a letter-of-protest, mentioning the expected and not discharged volumes in the terminal.

11.3 The recordings of operational occurrences (time-sheet) and pressures shall be completed and ratified by the parties.

12 Acceptable Quantitative Differences

12.1 The differences among the measured volumes at origin and destination shall not exceed the allowable limits, which serve as parameters to evaluate the trip result.

12.1.1 Original Board/Destination Board

Limit: between -0,2 % and +0,2 %

NOTE When the difference between the inboard amounts measured at origin and destiny is off the -0,2 % a +0,2 % tolerance range, the terminal's representative shall issue the ship's representative a letter-of-protest.be for the due explanations.

12.1.2 Original Shore/Destination Shore:

- a) limit for white and dark derivatives: between -0,65 % and +0,15 %;
- b) limit for national oil: -0,50 %;
- c) limit for oil import: -0,30 %.

NOTE The amounts measured at both the origin shore and at destination shore shall be calculated by using the same conversion table, and at the same reference temperature.

12.2 After the inspection for releasing the ship, if the differences in the destiny are off-limits, and the root-causes are not identified either in the terminal or in the ship, the terminal's representative shall issue the ship's representative a letter-of-protest, and inform the load owner.

12.3 For the loading and offloading operations, it is tolerable a difference between the amount measured in the onshore tanks, and the one measured in the onboard tanks, corrected by the VEF, within -0,3 % and +0,3 % as to the amount measured in the shore tanks. If the ship has no VEF, the difference between the amount measured in the shore tanks and the one measured in the onboard tanks shall be within -0,5 % and +0,5 % as to the amount measured in the shore tanks. If such differences are off those limits, the terminal's representative shall issue the ship's representative a letter-of-protest, and inform the load owner.

13 Surveyor on Loading and Offloading Operations

13.1 The surveyor is allowed to startup the services after having been issued a service order either by PETROBRAS or the load owner.

13.2 The following information shall be available to the terminal with minimum of 24-hour advance prior to beginning the loading/offloading operation, monitored by the surveyor:

- a) name of the designated surveyor;
- b) location for execution of services;
- c) name of the ship;
- d) date provided for the beginning of services;
- e) name, amount and quality of the product to be loaded/offloaded, inspected and analyzed;
- f) name, amount, origin and destination of the product, when it is a load being transported;
- g) tables to be used for calculation of the handled amounts;
- h) types of desired tests;
- i) types of desired sampling;
- j) any PETROBRAS' instruction or guidance whatsoever.

13.3 The terminal shall checkup the following requirements:

- a) the services performed as to the techniques and regulations approved by PETROBRAS;
- b) the witness samples collected by the surveyor.

13.4 The surveyor shall monitor the measurements and samplings carried out in the ship by complying with the due regulations and standards, with calibrated and certified instruments. Upon request, the surveyor shall inspect tanks/grids.

13.5 The surveyor shall supervise the addition of colorants or additives to products on board, and register in the final report.

13.6 The surveyor shall require the ship's representative the records which demonstrate compliance with the routines for cleaning the onboard tanks, considering the products to be transported as to the last ones offloaded, and adopting the procedures defined in the PETROBRAS [N-2673](#), and the criteria mentioned in topic 4.3 of this Standard.

13.6.1 If necessary, the surveyor shall report to the area in charge of contract supervision in PETROBRAS for using the PETROBRAS [N-2673](#).

13.6.2 If the cleaning conditions in the onboard tanks are not acceptable, the surveyor shall issue the ship's representative a letter-of-protest, with copies for the contract supervisor and the terminal, and explaining and requiring corrective actions in order to enable loading.

13.7 Checking Product Quality

13.7.1 The surveyor shall check the alignment of the terminal/ship operation, informing and registering the identified abnormalities.

13.7.2 In the specific cases required by the load owner, the surveyor shall inspect the interior of the onboard tanks scheduled for loading, and shall follow the procedures outlined in the topic 4.2.1 of this Standard.

13.7.3 The surveyor shall check all the slop tanks by registering all existent remaining of the last loading.

13.7.4 The surveyor shall register the last 3 loads in the onboard tanks which shall receive the product to be loaded.

13.7.5 The surveyor shall check, sample and register the loads in transit.

13.7.6 The surveyor shall report any evidence of product transfer among the load tanks and the ballast or slop tank, or among the load tanks only.

13.7.7 The surveyor shall ensure the collected samples are sealed, and the identification tags are signed-off by the representatives of PETROBRAS', the surveyor's and the ship's.

13.7.8 The surveyor shall give PETROBRAS a list of the witness samples with their respective seal numbering.

13.7.9 The surveyor shall comply with the 90-day lead time, as to the collecting date, for keeping the witness samples.

13.7.10 The surveyor shall apply a methodology of consistency analysis for the results of the samples collected in pipelines in order to prevent contamination, by comparing the results to those of the shore and onboard tanks.

13.7.11 Any non-compliance observed at either origin or destination shall be reported immediately to the contract management by the surveyor. The terminal shall observe and report irregularities and their needs immediately, and including proposals for improvement, when applicable.

13.8 Checking Product Quantity

13.8.1 The surveyor shall register the measurements of level of products, free water, BSW, and of product temperature in shore tanks prior to and after loading or offloading.

13.8.2 The surveyor shall calculate the on shore and on board amounts together with the parties involved in each situation.

13.8.3 For heated products, a 2-hour minimum waiting time shall be followed after heating is turned off for initial measurement, aiming at homogenization of product temperature.

13.8.4 The surveyor shall register the quantities of product, free water and BSW measured on board prior to offloading, and compare them to those which were determined on board the ship when leaving the loading port.

NOTE The surveyor shall issue a letter-of-protest, establishing liabilities, when applicable.



13.8.5 For determining the VEF, the surveyor shall register at least the amounts of the last 5 loadings of the ship.


13.9 The final report shall contain any abnormalities found during the execution of the inspection services for quality and quantity.


13.10 For performance appraisal, the terminal's representative shall fill out the performance check lists for the surveyor's job in the labs and in the operation areas. The check lists are under responsibility of the surveyor's contractor. The scope of the check lists shall aim at the surveyor's operations and measurements. The surveyor's contractor shall evaluate the surveyor's forms, and to trigger corrective actions.


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			of																					
TITLE: INITIAL LETTER FOR LOADING/OFFLOADING OPERATIONS																								
General information																								
Ship: _____ Trip: _____ Phase: _____ Port: _____ Berth: _____ Berthing: ____ / ____ / ____																								
Ship Contractual Data (As Per Charter Party)																								
1. Duration time for loading/offloading operations: _____; 2. Volumetric capacity of tanks (98%) _____ (m ³); 3. Guaranteed Pressure by contract: _____ (kgf/cm ²).																								
Trip Information																								
1 Type of charter party: _____; 2 Type of trip (Cabotage/Import/Export) _____; 3 Origin port: _____ Destiny Port: _____; 4 Has the ship requested fueling?: _____.																								
Communication between ship and terminal																								
1 Communication between ship/terminal shall be done by: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 15%;">Primary</th> <th style="width: 15%;">Secondary</th> <th style="width: 70%;">Description</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>VHF Radio (Marine) - channel: _____</td> </tr> <tr> <td></td> <td></td> <td>Radio supplied by the terminal - channel: _____</td> </tr> <tr> <td></td> <td></td> <td>Radio supplied by the ship - channel: _____</td> </tr> <tr> <td></td> <td></td> <td>Dedicated telephone</td> </tr> <tr> <td></td> <td></td> <td>Terminal (_____)</td> </tr> <tr> <td></td> <td></td> <td>Ship (_____)</td> </tr> </tbody> </table> <p style="text-align: center; margin-top: 10px;">If all the resources fail, the operation shall be halted immediately.</p>				Primary	Secondary	Description			VHF Radio (Marine) - channel: _____			Radio supplied by the terminal - channel: _____			Radio supplied by the ship - channel: _____			Dedicated telephone			Terminal (_____)			Ship (_____)
Primary	Secondary	Description																						
		VHF Radio (Marine) - channel: _____																						
		Radio supplied by the terminal - channel: _____																						
		Radio supplied by the ship - channel: _____																						
		Dedicated telephone																						
		Terminal (_____)																						
		Ship (_____)																						
2 The language used for communication between ship/terminal is: [] Portuguese [] English																								
3 Emergency signals in the Terminal (siren): Emergency start: ____ ____ ____ On hearing the signal, all operations shall be halted immediately. Emergency End: ____ ____ ____																								
4 Emergency signals in the ship (whistle): Emergency start: ____ ____ ____ Emergency end: ____ ____ ____																								
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INITIAL LETTER FOR LOADING/OFFLOADING OPERATIONS			
General Information			
<p>1 Does the ship require discharging slop? <input type="checkbox"/> Yes <input type="checkbox"/> No Is the slop free of chemical residue? _____</p> <p>2 No repair in either the ship's facilities or the terminal's facilities is allowed to be carried out without the authorizations from both representatives of the ship and the terminal.</p> <p>3 The ship's representative shall hand the terminal's representative a copy of its loading/offloading operation plan prior to the start of operations.</p> <p>4 The terminal pipelines have a counter-pressure of ____ kg/cm² in the ship's inlets.</p> <p>5 Samplings: _____</p> <p>6 Notes: _____</p>			
Conditions for operation monitoring			
<p>1 The ship shall inform the Terminal the flow rate, the pressure in the manifold and the amount moved at every 1 hour interval. These data shall be reported to the terminal within 15 minutes after the reading. Noncompliance with this procedure shall cause the operation to be IMMEDIATELY INTERRUPTED.</p> <p>2 The Terminal lines produce a counter-pressure on the ship's manifold of ____ kgf/cm².</p> <p>3 The Terminal may only authorize the beginning/resumption of operations after receiving from the ship the "READY TO OPERATE" warning. This information may be made via: <input type="checkbox"/> MARINE VHF radio, agreed channel, with digital recording; <input type="checkbox"/> own form.</p> <p>4 The "Ready to Operate" is valid for 1 hour as of the time of its issuance. In case operation is interrupted for more than 1 hour, a new "Ready to Operate" shall be issued between ship/terminal in order to resume pumping.</p> <p>5 The Ship shall report to the Terminal, in advance of 15 minutes, about any change in the initially agreed operating conditions.</p> <p>6 The Ship/Terminal shall begin the loading/offloading operation with reduced flow rate and pressure, increasing them gradually until the pre-established limit.</p> <p>7 The ship's representative shall monitor in real time the flows and pressures in the ship's manifold and the loading/offloading quantities during the operations in this terminal.</p> <p>8 The ship's representative shall alert the terminal's representative upon the operation ending with 30 min minimum precedence.</p> <p>9 The ship's representative shall inform the terminal's representative about the operation start, and afterwards at every 15 min maximum time interval, until the variables get stabilized within the references established by PETROBRAS, when the info frequency can be hourly. The ship's values shall be compared against the terminal's ones. The non-compliance of this procedure shall bring about immediate operation halt, of which liability for delays or costs whatsoever is due to the ship's representative entirely.</p>			
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											of				
<p>NOTA The terminal's representative shall halt the operations if the differences in volume between the ship and the terminal are higher than the limits established by this Standard.</p>															
TERMINAL's conditions for operation															
Load seq	Product	Operation	Tank in terminal	Total vol (m³ amb)	Lines	Load arms		Max flow (m³/h)			Max pressure (kgf/cm²)			Temp °C	
						No.	Dia.	I	T	F	I	T	F	Min	Max
I: initial; T: transient; F: final															
SHIP's conditions for operation															
Load seq	Product	Operation	Scheduled Vol (m³ amb)	Onboard Tanks	# Pumps	Inlets	Max flow (m³/h)			Max pressure (kgf/cm²)			Temp °C		
							I	T	F	I	T	F	Min	Max	
I: initial; T: transient; F: final															
<p>Any agreed changes in the operation conditions shall be notified within 1 hour.</p>															
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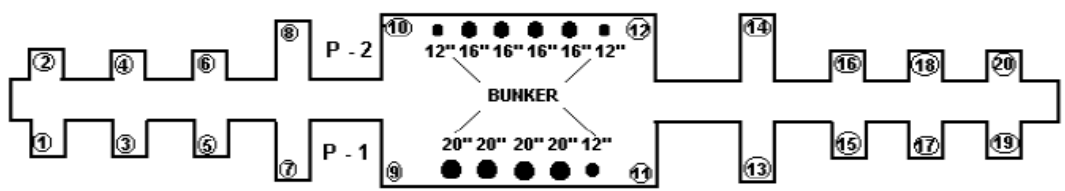
		NR.	REV.																																							
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TITLE: INITIAL LETTER FOR LOADING/OFFLOADING OPERATIONS																																										
Additional Information about Operation and Safety																																										
<p>1 The parts hereby agree that the people in charge of supervision and control of the operation are the representatives of the terminal and the ship.</p> <p>2 Loading operation shall only be started after full compliance with the safety rules established in the <u>ISGOTT's</u> latest edition, and after completion and sign-off of this document.</p> <p>3 The representatives of the terminal and the ship are responsible for the adequacy and operability of their instruments (indications of LEVEL and TEMPERATURE in the tanks, and PRESSURE in the manifold and loading arms). Absence or failures of these instruments shall require either immediate halt of the operation or prevent its onset until they are operational or other control measures are adopted.</p> <p>4 The manifold valves in the terminal shall remain shut until there is the release prompt "Ready to Operate" by the ship's representative. If the operation is halted, these valves shall be shut again until the causes are eliminated. IMPORTANT: the terminal oil pipelines do not have check valves.</p> <p>5 For either an emergency or something unusual to have happened as to environmental and operational safety, the operations shall be IMMEDIATELY HALTED with the shutting of the valves in the ship and in the terminal until the causes are eliminated.</p> <p>6 The load intake valves in the SHIP shall not be opened until a determined pressure level is reached in the cargo pumps, for there is a possibility of the TERMINAL line be pressurized.</p> <p>7 The ship's representative may monitor the sampling in the terminal at the start of the loading operation.</p> <p>8 The ship's representative shall inform the terminal's representative the onboard fuel has flash point above 60°C (140°F).</p> <p>9 The document "Monitoring Pressures during Operations" is to be signed-off by either the ship's representative or his deputy every hour, or whenever required by the terminal's representative.</p> <p>10 The ship's representative shall be in charge of supplying and installing the connections for coupling the loading arms to the ship's hoses.</p> <p>11 In case of risks in the terminal's or the ship's facilities, the terminal's representative shall require tugboats if the ship moves away from the pier for strong winds or currents.</p> <p>12 If applicable, the ship's representative shall require tugboats in accordance with information in the terminal; nevertheless, the terminal's representative shall be responsible for releasing the cables by the ship's unmooring.</p> <p>13 The ship's representative shall handle the terminal's representative the documents as to the last three loading operations.</p> <p>14 Maximum limits of currents and winds for interrupting an operation:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; width: 60%;"> <thead> <tr> <th style="width: 20%;">Pier</th> <th style="width: 30%;">Current</th> <th style="width: 30%;">Wind</th> </tr> </thead> <tbody> <tr> <td>P ____</td> <td></td> <td></td> </tr> <tr> <td>P ____</td> <td></td> <td></td> </tr> </tbody> </table> <p>15 The Pier's operational safety limits of this terminal berths for the draft and the free board are respectively:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; width: 80%;"> <thead> <tr> <th style="width: 10%;">Pier</th> <th colspan="2" style="width: 40%;">Maximum</th> <th colspan="2" style="width: 40%;">Minimum</th> </tr> <tr> <th>Pier</th> <th>Draft</th> <th>Free Board Level</th> <th>Draft</th> <th>Free Board Level</th> </tr> </thead> <tbody> <tr> <td>P ____</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P ____</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P ____</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>P ____</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Pier	Current	Wind	P ____			P ____			Pier	Maximum		Minimum		Pier	Draft	Free Board Level	Draft	Free Board Level	P ____					P ____					P ____					P ____				
Pier	Current	Wind																																								
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16 To inform below the mooring lines used to moor a ship:

Pier	Ship		
P ____	Bow	Recommended by the Terminal	Used by the ship
			_____ Head _____ Breast _____ Springs
P ____	Stern		_____ Head _____ Breast _____ Springs

17 The ship's representative shall present below the direction of the mooring lines in their respective mooring bollard or hooks (dolphins).



18 In case of an emergency unmooring is needed, both representatives of the ship and the terminal shall define and report the releasing sequence of the lines.

Remarks

 Terminal's Representative

 Ship's Representative

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