

(i) Lightering operations shall not be conducted within 1 nautical mile of offshore structures or mobile offshore drilling units.

(j) No vessel engaged in lightering activities may anchor over charted pipelines, artificial reefs, or historical resources.

(k) All vessels engaged in lightering activities shall be able to immediately maneuver at all times while inside a designated lightering zone. The main propulsion system must not be disabled at any time.

(l) In preparing to moor alongside the vessel to be lightered, a service vessel shall not approach the vessel to be lightered closer than 1000 meters unless the service vessel is positioned broad on the quarter of the vessel to be lightered. The service vessel must transition to a nearly parallel heading prior to closing to within 50 meters of the vessel to be lightered.

## **PART 157—RULES FOR THE PROTECTION OF THE MARINE ENVIRONMENT RELATING TO TANK VESSELS CARRYING OIL IN BULK**

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AUTHORITY: 33 U.S.C. 1903; 46 U.S.C. 3703, 3703a (note); 49 CFR 1.46. Subparts G, H, and I are also issued under section 4115(b), Pub. L. 101-380, 104 Stat. 520; Pub. L. 104-55, 109 Stat. 546.

SOURCE: CGD 74-32, 40 FR 48283, Oct. 14, 1975, unless otherwise noted.

**Subpart A—General**

**§ 157.01 Applicability.**

(a) Unless otherwise indicated, this part applies to each vessel that carries oil in bulk as cargo and that is:

(1) Documented under the laws of the United States (a U.S. vessel); or

(2) Any other vessel that enters or operates in the navigable waters of the United States, or that operates, conducts ligtering under 46 U.S.C. 3715, or receives cargo from or transfers cargo to a deepwater port under 33 U.S.C. 1501 *et seq.*, in the United States Exclusive Economic Zone, as defined in 33 U.S.C. 2701(8).

(b) This part does not apply to a vessel exempted under 46 U.S.C. 2109 or 46 U.S.C. 3702.

[CGD 90-051, 57 FR 36238, Aug. 12, 1992, as amended by CGD 91-045, 61 FR 39788, July 30, 1996]

**§ 157.02 Incorporation by reference.**

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER; and the material must be available to the public. All approved material is available for inspection at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC, and at the U.S. Coast Guard, Office of Operating and Environmental Standards (GMSO), 2100 Second Street SW., Washington, DC 20593-0001, and is available from the sources indicated in paragraph (b) of this section.

(b) The material approved for incorporation by reference in this part and the sections affected are as follows:

*International Maritime Organization (IMO)*—4 Albert Embankment, London SE1 7SR, England.

IMO Assembly Resolution A.601(15), Provision and Display of Manoeuvring Information on Board Ships, Annex sections 1.1, 2.3, 3.1, and 3.2 with appendices, adopted on 19 November 1987 .....	157.450
IMO Assembly Resolution A.744(18), Guidelines on the Enhanced Programme of Inspections During Surveys of Bulk Carriers and Oil Tankers, Annex B sections 1.1.3-1.1.4, 1.2-1.3, 2.1, 2.3-2.6, 3-8, and Annexes 1-10 with appendices, adopted 4 November 1993 .....	157.430
IMO Assembly Resolution A.751(18), Interim Standards for Ship Manoeuvrability, Annex sections 1.2, 2.3-2.4, 3-4.2, and 5, adopted 4 November 1993 with Explanatory Notes in MSC/Circ. 644 dated 6 June 1994 .....	157.445

*Oil Companies International Marine Forum (OCIMF)*—15th Floor, 96 Victoria Street, London, SW1E 5JW, England.  
 International Safety Guide for Oil Tankers and Terminals, Fourth Edition, Chapters 6, 7, and 10, 1996 ..... 157.435

[CGD 91-045, 61 FR 39788, July 30, 1996; 61 FR 41685, Aug. 9, 1996]

**§ 157.03 Definitions.**

Except as otherwise stated in a subpart:

*Amidships* means the middle of the length.

*Animal fat* means a non-petroleum oil, fat, or grease derived from animals and not specifically identified elsewhere in this part.

*Ballast voyage* means the voyage that a tank vessel engages in after it leaves the port of final cargo discharge.

*Breadth* or *B* means the maximum molded breadth of a vessel in meters.

*Cargo tank length* means the length from the forward bulkhead of the forwardmost cargo tanks, to the after bulkhead of the aftermost cargo tanks.

*Center tank* means any tank inboard of a longitudinal bulkhead.

*Clean ballast* means ballast which:

(1) If discharged from a vessel that is stationary into clean, calm water on a clear day, would not—

(i) Produce visible traces of oil on the surface of the water or on adjoining shore lines; or

(ii) Cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shore lines; or

(2) If verified by an approved cargo monitor and control system, has an oil content that does not exceed 15 p.m.

*Combination carrier* means a vessel designed to carry oil or solid cargoes in bulk.

*Crude oil* means any liquid hydrocarbon mixture occurring naturally in the earth, whether or not treated to render it suitable for transportation, and includes crude oil from which certain distillate fractions may have been removed, and crude oil to which certain distillate fractions may have been added.

*Deadweight* or *DWT* means the difference in metric tons between the lightweight displacement and the total displacement of a vessel measured in water of specific gravity 1.025 at the

load waterline corresponding to the assigned summer freeboard.

*Dedicated clean ballast tank* means a cargo tank that is allocated solely for the carriage of clean ballast.

*Domestic trade* means trade between ports or places within the United States, its territories and possessions, either directly or via a foreign port including trade on the navigable rivers, lakes, and inland waters.

*Double bottom* means watertight protective spaces that do not carry any oil and which separate the bottom of tanks that hold any oil within the cargo tank length from the outer skin of the vessel.

*Double hull* means watertight protective spaces that do not carry any oil and which separate the sides, bottom, forward end, and aft end of tanks that hold any oil within the cargo tank length from the outer skin of the vessel as prescribed in § 157.10d.

*Doubles sides* means watertight protective spaces that do not carry any oil and which separate the sides of tanks that hold any oil within the cargo tank length from the outer skin of the vessel.

*Existing vessel* means any vessel that is not a new vessel.

*Fleeting or assist towing vessel* means any commercial vessel engaged in towing astern, alongside, or pushing ahead, used solely within a limited geographic area, such as a particular barge fleeting area or commercial facility, and used solely for restricted service, such as making up or breaking up larger tows.

*Foreign trade* means any trade that is not domestic trade.

*From the nearest land* means from the baseline from which the territorial sea of the United States is established in accordance with international law.

*Inland vessel* means a vessel that is not oceangoing and that does not operate on the Great Lakes.

*Instantaneous rate of discharge of oil content* means the rate of discharge of

oil in liters per hour at any instant, divided by the speed of the vessel in knots at the same instant.

*Integrated tug barge* means a tug and a tank barge with a mechanical system that allows the connection of the propulsion unit (the tug) to the stern of the cargo carrying unit (the tank barge) so that the two vessels function as a single self-propelled vessel.

Large primary structural member includes any of the following:

- (1) Web frames.
- (2) Girders.
- (3) Webs.
- (4) Main brackets.
- (5) Transverses.
- (6) Stringers.
- (7) Struts in transverse web frames

when there are 3 or more struts and the depth of each is more than  $\frac{1}{15}$  of the total depth of the tank.

*Length* or *L* means the distance in meters from the fore side of the stem to the axis of the rudder stock on a waterline at 85 percent of the least molded depth measured from the molded baseline, or 96 percent of the total length on that waterline, whichever is greater. In vessels designed with drag, the waterline is measured parallel to the designed waterline.

*Lightweight* means the displacement of a vessel in metric tons without cargo, oil fuel, lubricating oil, ballast water, fresh water, and feedwater in tanks, consumable stores, and any persons and their effects.

*Major conversion* means a conversion of an existing vessel that:

- (1) Substantially alters the dimensions or carrying capacity of the vessel, except a conversion that includes only the installation of segregated ballast tanks, dedicated clean ballast tanks, a crude oil washing system, double sides, a double bottom, or a double hull;
- (2) Changes the type of vessel;
- (3) Substantially prolongs the vessel's service life; or
- (4) Otherwise so changes the vessel that it is essentially a new vessel, as determined by the Commandant (G-MOC).

*MARPOL Protocol* means the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, done at London

on February 17, 1978. This Protocol incorporates and modifies the International Convention for the Prevention of Pollution from Ships, 1973, done at London on November 2, 1973.

*New vessel* means:

(1) A U.S. vessel in domestic trade that:

- (i) Is constructed under a contract awarded after December 31, 1974;
- (ii) In the absence of a building contract, has the keel laid or is at a similar stage of construction after June 30, 1975;
- (iii) Is delivered after December 31, 1977; or
- (iv) Has undergone a major conversion for which:

(A) The contract is awarded after December 31, 1974;

(B) In the absence of a contract, conversion is begun after June 30, 1975; or

(C) Conversion is completed after December 31, 1977; and

(2) A foreign vessel or a U.S. vessel in foreign trade that:

- (i) Is constructed under a contract awarded after December 31, 1975;
- (ii) In the absence of a building contract, has the keel laid or is at a similar stage of construction after June 30, 1976;
- (iii) Is delivered after December 31, 1979; or
- (iv) Has undergone a major conversion for which:

(A) The contract is awarded after December 31, 1975;

(B) In the absence of a contract, conversion is begun after June 30, 1976; or

(C) Conversion is completed after December 31, 1979.

*Non-petroleum oil* means oil of any kind that is not petroleum-based. It includes, but is not limited to, animal fat and vegetable oil.

*Oceangoing* has the same meaning as defined in §151.05 of this chapter.

*Officer in charge of a navigational watch* means any officer employed or engaged to be responsible for navigating or maneuvering the vessel and for maintaining a continuous vigilant watch during his or her periods of duty and following guidance set out by the master, international or national regulations, and company policies.

*Oil* means oil of any kind or in any form including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. This includes liquid hydrocarbons as well as animal and vegetable oils.

*Oil fuel* means any oil used as fuel for machinery in the vessel in which it is carried.

*Oil spill response vessel* means a vessel that is exclusively dedicated to operations to prevent or mitigate environmental damage due to an actual or impending accidental oil spill. This includes a vessel that performs routine service as an escort for a tank vessel, but excludes a vessel that engages in any other commercial activity, such as the carriage of any type of cargo.

*Oil tanker* means a vessel that is constructed or adapted primarily to carry crude oil or products in bulk as cargo. This includes a tank barge, a tankship, and a combination carrier, as well as a vessel that is constructed or adapted primarily to carry noxious liquid substances in bulk as cargo and which also carries crude oil or products in bulk as cargo.

*Oily mixture* means a mixture with any oil content.

*Other non-petroleum oil* means an oil of any kind that is not petroleum oil, an animal fat, or a vegetable oil.

*Permeability of a space* means the ratio of the volume within a space that is assumed to be occupied by water to the total volume of that space.

*Petroleum oil* means petroleum in any form including crude oil, fuel oil, mineral oil, sludge, oil refuse, and refined products.

*Primary towing vessel* means any vessel engaged in towing astern, alongside, or pushing ahead and includes the tug in an integrated tug barge. It does not include fleeting or assist towing vessels.

*Product* means any liquid hydrocarbon mixture in any form, except crude oil, petrochemicals, and liquefied gases.

*Segregated ballast* means the ballast water introduced into a tank that is completely separated from the cargo oil and oil fuel system and that is permanently allocated to the carriage of ballast.

*Slop tank* means a tank specifically designated for the collection of cargo drainings, washings, and other oil mixtures.

*Tank* means an enclosed space that is formed by the permanent structure of a vessel, and designed for the carriage of liquid in bulk.

*Tank barge* means a tank vessel not equipped with a means of self-propulsion.

*Tank vessel* means a vessel that is constructed or adapted primarily to carry, or that carries, oil or hazardous material in bulk as cargo or cargo residue, and that—

- (1) Is a vessel of the United States;
- (2) Operates on the navigable waters of the United States; or
- (3) Transfers oil or hazardous material in a port or place subject to the jurisdiction of the United States. This does not include an offshore supply vessel, or a fishing vessel or fish tender vessel of not more than 750 gross tons when engaged only in the fishing industry.

*Tankship* means a tank vessel propelled by mechanical power or sail.

*Vegetable oil* means a non-petroleum oil or fat not specifically identified elsewhere in this part that is derived from plant seeds, nuts, kernels, or fruits.

*Wing tank* means a tank that is located adjacent to the side shell plating.

[CGD 96-026, 61 FR 33666, June 28, 1996; 61 FR 36786, July 12, 1996, as amended by CGD 91-045, 61 FR 39788, July 30, 1996]

#### § 157.04 Authorization of classification societies.

(a) The Coast Guard may authorize any classification society (CS) to perform certain plan reviews, certifications, and inspections required by this part on vessels classed by that CS, except that only U.S. classification societies may be authorized to perform those plan reviews, inspections, and certifications for U.S. vessels.

(b) If a CS desires authorization to perform the plan reviews, certifications, and inspections required under this part, it must submit to the Commandant (G-MOC), U.S. Coast Guard, Washington, DC 20593-0001, evidence from the governments concerned showing that they have authorized the CS

to inspect and certify vessels on their behalf under the MARPOL Protocol.

(c) The Coast Guard notifies the CS in writing whether or not it is accepted as an authorized CS. If authorization is refused, reasons for the refusal are included.

(d) Acceptance as an authorized CS terminates unless the following are met:

(1) The authorized CS must have each Coast Guard regulation that is applicable to foreign vessels on the navigable waters of the United States.

(2) Each issue concerning equivalents to the regulations in this part must be referred to the Coast Guard for determination.

(3) Copies of any plans, calculations, records of inspections, or other documents relating to any plan review, inspection, or certification performed to meet this part must be made available to the Coast Guard.

(4) Each document certified under §§ 157.116(a)(2), 157.118(b)(1)(ii), and 157.216(b)(1)(ii) must be marked with the name or seal of the authorized CS.

(5) A copy of the final documentation that is issued to each vessel that is certified under this part must be referred to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11625, and 11630, Mar. 22, 1985, as amended by CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

#### § 157.05 Performing calculations for this part.

In this part, unless the context requires otherwise:

(a) Formulas are in the International System of Units (SI);

(b) Values used in those formulas must be in the International System of Units; and

(c) Forward and after perpendiculars are located at the forward end and at the after end of the length. The forward perpendicular coincides with the foreside of the stem on the waterline on which the length of the vessel is measured.

#### § 157.06 Appeals.

(a) Any person directly affected by an action taken under this part may request reconsideration by the Coast Guard official who is responsible for that action.

(b) Any person not satisfied with a ruling made under the procedure contained in paragraph (a) of this section may appeal that ruling in writing, except as allowed under paragraph (e) of this section, to the Coast Guard District Commander of the district in which the action was taken. The appeal may contain supporting documentation and evidence that the appellant wishes to have considered. If requested, the District Commander may stay the effect of the action being appealed while the ruling is being reviewed. The District Commander issues a ruling after reviewing the appeal submitted under this paragraph.

(c) Any person not satisfied with a ruling made under the procedure contained in paragraph (b) of this section may appeal that ruling in writing, except as allowed under paragraph (e) of this section, to the Assistant Commandant for Marine Safety and Environmental Protection, U.S. Coast Guard, Washington, DC 20593-0001. The appeal may contain supporting documentation and evidence that the appellant wishes to have considered. If requested, the Assistant Commandant for Marine Safety and Environmental Protection may stay the effect of the action being appealed while the ruling is being reviewed. The Chief, Marine Safety and Environmental Protection issues a ruling after reviewing the appeal submitted under this paragraph.

(d) Any decision made by the Assistant Commandant for Marine Safety and Environmental Protection under the procedure contained in paragraph (c) of this section is final agency action.

(e) If the delay in presenting a written appeal would have a significant adverse impact on the appellant, the appeal under paragraph (b) or (c) of this section may initially be presented orally. If an initial presentation of the appeal is made orally, the appellant must submit the appeal in writing within five days of the oral presentation to the Coast Guard official to whom the

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oral presentation was made. The written appeal must contain, at a minimum the basis for the appeal and a summary of the material presented orally.

[CGD 77-058b, 45 FR 43706, June 30, 1980, as amended by CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33667, 33668, June 28, 1996; CGD 97-023, 62 FR 33364, June 19, 1997]

### § 157.07 Equivalents.

The Coast Guard may accept an equivalent, in accordance with the procedure in 46 CFR 30.15-1, of a design or an equipment to fulfill a requirement in this Part, except an operational method may not be substituted for a design or equipment requirement that is also required under the MARPOL Protocol.

[CGD 82-28, 50 FR 11625, Mar. 22, 1985, as amended by CGD 97-023, 62 FR 33364, June 19, 1997]

### Subpart B—Design, Equipment, and Installation

#### § 157.08 Applicability of Subpart B.

NOTE: An “oil tanker” as defined in § 157.03 includes barges as well as self-propelled vessels.

(a) Sections 157.10d and 157.11(g) apply to each vessel to which this part applies.

(b) Sections 157.11 (a) through (f), 157.12, 157.15, 157.19(b)(3), 157.33, and 157.37 apply to each vessel to which this part applies that carries 200 cubic meters or more of crude oil or products in bulk as cargo, as well as to each oceangoing oil tanker to which this part applies of 150 gross tons or more. These sections do not apply to a foreign vessel which remains beyond the navigable waters of the United States and does not transfer oil cargo at a port or place subject to the jurisdiction of the United States.

(c) Section 157.21 applies to each oil tanker to which this part applies of 150 gross tons or more that is oceangoing or that operates on the Great Lakes. This section does not apply to a foreign vessel which remains beyond the navigable waters of the United States and does not transfer oil cargo at a port or place subject to the jurisdiction of the United States.

(d) Sections in subpart B of 33 CFR part 157 that are not specified in paragraphs (a) through (c) of this section apply to each oceangoing oil tanker to which this part applies of 150 gross tons or more, unless otherwise indicated in paragraphs (e) through (m) of this section. These sections do not apply to a foreign vessel which remains beyond the navigable waters of the United States and does not transfer oil cargo at a port or place subject to the jurisdiction of the United States.

(e) Sections 157.11 (a) through (f), 157.12, and 157.15 do not apply to a vessel, except an oil tanker, that carries less than 1,000 cubic meters of crude oil or products in bulk as cargo and which retains oily mixtures on board and discharges them to a reception facility.

(f) Sections 157.11 (a) through (f), 157.12, 157.13, and 157.15 do not apply to a tank vessel that carries only asphalt, carbon black feedstock, or other products with similar physical properties, such as specific gravity and cohesive and adhesive characteristics, that inhibit effective product/water separation and monitoring.

(g) Sections 157.11 (a) through (f), 157.12, 157.13, 157.15, and 157.23 do not apply to a tank barge that cannot ballast cargo tanks or wash cargo tanks while underway.

(h) Sections 157.19 and 157.21 do not apply to a tank barge that is certificated by the Coast Guard for limited short protected coastwise routes if the barge is otherwise constructed and certificated for service exclusively on inland routes.

(i) Section 157.09(d) does not apply to any:

(1) U.S. vessel in domestic trade that is constructed under a contract awarded before January 8, 1976;

(2) U.S. vessel in foreign trade that is constructed under a contract awarded before April 1, 1977; or

(3) Foreign vessel that is constructed under a contract awarded before April 1, 1977.

(j) Sections 157.09 and 157.10a do not apply to a new vessel that:

(1) Is constructed under a building contract awarded after June 1, 1979;



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(2) In the absence of a building contract, has the keel laid or is at a similar stage of construction after January 1, 1980;

(3) Is delivered after June 1, 1982; or

(4) Has undergone a major conversion for which:

(i) The contract is awarded after June 1, 1979;

(ii) In the absence of a contract, conversion is begun after January 1, 1980; or

(iii) Conversion is completed after June 1, 1982.

(k) Sections 157.09(b)(3), 157.10(c)(3), 157.10a(d)(3), and 157.10b(b)(3) do not apply to tank barges.

(l) Section 157.10b does not apply to tank barges if they do not carry ballast while they are engaged in trade involving the transfer of crude oil from an offshore oil exploitation or production facility on the Outer Continental Shelf of the United States.

(m) Section 157.12 does not apply to a U.S. vessel that:

(1) Is granted an exemption under Subpart F of this part; or

(2) Is engaged solely in voyages that are:

(i) Between ports or places within the United States, its territories or possessions;

(ii) Of less than 72 hours in length; and

(iii) At all times within 50 nautical miles of the nearest land.

(n) Section 157.10d does not apply to:

(1) A vessel that operates exclusively beyond the navigable waters of the United States and the United States Exclusive Economic Zone, as defined in 33 U.S.C. 2701(8);

(2) An oil spill response vessel;

(3) Before January 1, 2015—

(i) A vessel unloading oil in bulk as cargo at a deepwater port licensed under the Deepwater Port Act of 1974 (33 U.S.C. 1501 *et seq.*); or

(ii) A delivering vessel that is off-loading oil in bulk as cargo in lightering activities—

(A) Within a lightering zone established under 46 U.S.C. 3715(b)(5); and

(B) More than 60 miles from the territorial sea base line, as defined in 33 CFR 2.05-10.

(4) A vessel documented under 46 U.S.C., Chapter 121, that was equipped

with a double hull before August 12, 1992;

(5) A barge of less than 1,500 gross tons as measured under 46 U.S.C., Chapter 145, carrying refined petroleum in bulk as cargo in or adjacent to waters of the Bering Sea, Chukchi Sea, and Arctic Ocean and waters tributary thereto and in the waters of the Aleutian Islands and the Alaskan Peninsula west of 155 degrees west longitude; or

(6) A vessel in the National Defense Reserve Fleet pursuant to 50 App. U.S.C. 1744.

[CGD 75-240, 41 FR 54179, Dec. 13, 1976, as amended by CGD 77-058b, 45 FR 43707, June 30, 1980; CGD 79-152, 45 FR 82249, Dec. 15, 1980; CGD 76-088b, 48 FR 45720, Oct. 6, 1983; CGD 90-051, 57 FR 36239, Aug. 12, 1992; 57 FR 40494, Sept. 3, 1992; CGD 97-023, 62 FR 33364, June 19, 1997]

### § 157.09 Segregated ballast.

(a) A new vessel of 70,000 tons DWT or more must have segregated ballast tanks that have a total capacity to allow the vessel to meet the draft and trim requirements in paragraph (b) of this section without recourse to the use of oil tanks for water ballast.

(b) In any ballast condition during any part of a voyage, including that of lightweight with only segregated ballast, the vessel's drafts and trim must have the capability of meeting each of the following requirements:

(1) The molded draft amidship (dm) in meters without taking into account vessel deformation must not be less than dm in the following mathematical relationship:

$$dm=2.0+0.02L$$

(2) The drafts at the forward and after perpendiculars must correspond to those determined by the draft amidship as specified in paragraph (b)(1) of this section, in association with the trim by the stern of no more than 0.015L.

(3) The minimum allowable draft at the after perpendicular is that which is necessary to obtain full immersion of the propeller.

(c) The vessel may be designed to carry ballast water in cargo tanks during the condition described in §157.35.

(d) Segregated ballast spaces, voids, and other noncargo-carrying spaces for

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a vessel of conventional form must be distributed:

(1) So that the mathematical average of the hypothetical collision ( $O_c$ ) and the hypothetical stranding ( $O_s$ ) outflows as determined by the application of the procedures in §157.19 and Appendix B is 80 percent or less of the maximum allowable outflow ( $O_A$ ) as determined by §157.19(b)(1); and

(2) To protect at least 45 percent of the sum of the side and bottom shell areas, based upon projected molded dimensions, within the cargo tank length. When the vessel design configuration does not provide for the spaces to be distributed to protect at least 45 percent of the side and bottom shell areas, the spaces must be distributed so that the mathematical average of the hypothetical collision ( $O_c$ ) and the hypothetical stranding ( $O_s$ ) outflows, determined by application of the procedures in §157.19 and Appendix B, is a further 2 percent less than the maximum allowable outflow ( $O_a$ ) for each 1 percent by which the shell area protection coverage required is not achieved.

(e) A ballast space, void or other non-cargo-carrying space used to meet requirements in paragraph (d) of this section must separate the cargo tank boundaries from the shell plating of the vessel by at least 2 meters.

(f) A vessel of conventional form for application of this section has:

(1) A block coefficient of .80 or greater,

(2) A length to depth ratio between 12 and 16, and

(3) A breadth to depth ratio between 1.5 and 3.5.

(g) Segregated ballast spaces, voids, and other noncargo-carrying spaces for a vessel not of conventional form must be distributed in a configuration acceptable to the Coast Guard.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 74-32, 40 FR 49328, Oct. 22, 1975; CGD 75-201, 41 FR 1482, Jan. 8, 1976]

### §157.10 Segregated ballast tanks and crude oil washing systems for certain new vessels.

(a) This section applies to a new vessel that:

(1) Is constructed under a building contract awarded after June 1, 1979;

(2) In the absence of a building contract, has the keel laid or is at a similar stage of construction after January 1, 1980;

(3) Is delivered after June 1, 1982; or

(4) Has undergone a major conversion for which:

(i) The contract is awarded after June 1, 1979;

(ii) In the absence of a contract, conversion is begun after January 1, 1980; or

(iii) Conversion is completed after June 1, 1982.

(b) Each tank vessel under this section of 20,000 DWT or more that carries crude oil and of 30,000 DWT or more that carries products must have segregated ballast tanks that have a total capacity to allow the vessel to meet the draft and trim requirements in paragraph (c) of this section without recourse to the use of cargo tanks for water ballast.

(c) In any ballast condition during any part of a voyage, including that of lightweight with only segregated ballast, each tank vessel under paragraph (b) of this section must have the capability of meeting each of the following:

(1) The molded draft amidship ( $dm$ ) in meters, without taking into account vessel deformation, must not be less than  $dm$  in the following mathematical relationship:

$$dm = 2.0 + 0.02L$$

(2) The drafts at the forward and after perpendiculars must correspond to those determined by the draft amidship under paragraph (c)(1) of this section, in association with a trim by the stern of no more than 0.015L.

(3) The minimum draft at the after perpendicular is that which is necessary to obtain full immersion of the propeller.

(d) Segregated ballast tanks required in paragraph (b) of this section, voids, and other spaces that do not carry cargo must be distributed:

(1) For a vessel to which §157.10d applies, in accordance with §157.10d(c)(4); or,

(2) For a vessel to which §157.10d does not apply, in accordance with the procedure contained in appendix C to this part.

(e) Each tank vessel under this section of 20,000 DWT or more that carries

crude oil must have a crude oil washing system that meets the design, equipment, and installation requirements in Subpart D of this part.

(f) Each tank vessel under this section may be designed to carry ballast water in cargo tanks as allowed under § 157.35.

[CGD 77-058b, 45 FR 43707, June 30, 1980, as amended by CGD 90-051, 57 FR 36239, Aug. 12, 1992]

**§ 157.10a Segregated ballast tanks, crude oil washing systems, and dedicated clean ballast tanks for certain new and existing vessels of 40,000 DWT or more.**

(a) An existing vessel of 40,000 DWT or more that carries crude oil and a new vessel of 40,000 DWT or more but less than 70,000 DWT that carries crude oil must have:

(1) Segregated ballast tanks with a total capacity to meet the draft and trim requirements in paragraph (d) of this section; or

(2) A crude oil washing system that meets the design, equipment, and installation requirements of Subpart D of this part.

(b) [Reserved]

(c) An existing vessel of 40,000 DWT or more that carries products and a new vessel of 40,000 DWT or more but less than 70,000 DWT that carries products must have:

(1) Segregated ballast tanks with a total capacity to meet the draft and trim requirements in paragraph (d) of this section; or

(2) Dedicated clean ballast tanks that have a total capacity to meet the draft and trim requirements in paragraph (d) of this section and that meet the design and equipment requirements under Subpart E of this part.

(d) In any ballast condition during any part of a voyage, including that of lightweight with either segregated ballast in segregated ballast tanks or clean ballast in dedicated clean ballast tanks, each tank vessel under paragraph (a)(1), or (c) of this section must have the capability of meeting each of the following without recourse to the use of cargo tanks for water ballast:

(1) The molded draft amidship (dm) in meters, without taking into account vessel deformation, must not be less

than dm in the following mathematical relationship:

$$dm=2.0+0.02L$$

(2) The drafts at the forward and after perpendiculars must correspond to those determined by the draft amidship under paragraph (d)(1) of this section, in association with a trim by the stern of no more than 0.015L.

(3) The minimum draft at the after perpendicular is that which is necessary to obtain full immersion of the propeller.

(e) Each tank vessel that meets paragraph (a)(1), or (c) of this section may be designed to carry ballast water in cargo tanks as allowed under § 157.35.

NOTE: Segregated ballast tanks located in wing tanks provide protection against oil outflow in the event of a collision, ramming, or grounding.

[CGD 77-058b, 45 FR 43707, June 30, 1980, as amended by CGD 82-28, 50 FR 11626, Mar. 22, 1985; USCG-1998-3799, 63 FR 35531, June 30, 1998]

**§ 157.10b Segregated ballast tanks, dedicated clean ballast tanks, and special ballast arrangements for tank vessels transporting Outer Continental Shelf oil.**

(a) Each tank vessel that is engaged in the transfer of crude oil from an offshore oil exploitation or production facility on the Outer Continental Shelf of the United States on or after June 1, 1980 must, if segregated ballast tanks or dedicated clean ballast tanks are not required under § 157.09, § 157.10 or § 157.10a, have one of the following:

(1) Segregated ballast tanks with a total capacity to meet the draft and trim requirements in paragraph (b) of this section.

(2) Dedicated clean ballast tanks having a total capacity to meet the draft and trim requirements in paragraph (b) of this section and meeting the design and equipment requirements under Subpart E of this part.

(3) Special ballast arrangements acceptable to the Coast Guard.

(b) In any ballast condition during any part of a voyage, including that of lightweight with either segregated ballast in segregated ballast tanks or clean ballast in dedicated clean ballast tanks, each vessel under paragraph (a)(1) or (a)(2) of this section must have

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the capability of meeting each of the following:

(1) The molded draft amidship (dm), in meters, without taking into account vessel deformation, must not be less than "dm" in the following mathematical relationship:

dm=2.00+0.020L for vessels of 150 meters or more in length

dm=1.25+0.025L for vessels less than 150 meters in length

(2) The drafts, in meters, at the forward and after perpendiculars must correspond to those determined by the draft amidship under paragraph (b)(1) of this section, in association with a trim, in meters, by the stern (t) of no more than "t" in the following mathematical relationship:

t=0.015L for vessels of 150 meters or more in length

t=1.5+0.005L for vessels less than 150 meters in length

(3) The minimum draft at the after perpendicular is that which is necessary to obtain full immersion of the propeller.

(c) Special ballast arrangements are accepted under the procedures in paragraph (d) of this section if:

(1) The vessel is dedicated to one specific route;

(2) Each offshore transfer facility on the route is less than 50 miles from shore;

(3) The duration of the ballast voyage is less than 10 hours;

(4) They prevent the mixing of ballast water and oil; and

(5) They provide suitable draft and trim to allow for the safe navigation of the vessel on the intended route.

(d) The owner or operator of a vessel that meets paragraph (c) of this section must apply for acceptance of the special ballast arrangement, in writing, to the Officer in Charge, Marine Inspection, of the zone in which the vessel operates. The application must contain:

(1) The specific route on which the vessel would operate;

(2) The type of ballast to be carried;

(3) The location of the ballast on the vessel;

(4) Calculations of draft and trim for maximum ballast conditions; and

(5) The associated operating requirements or limitations necessary to ensure safe navigation of the vessel.

NOTE: Operating requirements or limitations necessary to ensure safe navigation of the vessel could include (but are not limited to) weather conditions under which the vessel would not operate and weather conditions under which cargo would be carried in certain cargo tanks on the ballast voyage.

(e) The Coast Guard will inform each applicant for special ballast arrangements under paragraph (d) of this section whether or not the arrangements are accepted. If they are not accepted, the reasons why they are not accepted will be stated.

(f) Each tank vessel under this section may be designed to carry ballast water in cargo tanks, as allowed under §157.35.

[CGD 79-152, 45 FR 82249, Dec. 15, 1980]

**§157.10c Segregated ballast tanks, crude oil washing systems, and dedicated clean ballast tanks for certain new and existing tankships of 20,000 to 40,000 DWT.**

(a) This section applies to each tankship of 20,000 DWT or more, but less than 40,000 DWT, except each one that—

(1) Is constructed under a building contract awarded after June 1, 1979;

(2) In the absence of a building contract, has the keel laid or is at a similar stage of construction after January 1, 1980;

(3) Is delivered after June 1, 1982; or

(4) Has undergone a major conversion, for which—

(i) The contract is awarded after June 1, 1979; or

(ii) Conversion is completed after June 1, 1982.

(b) On January 1, 1986, or 15 years after the date it was delivered to the original owner or 15 years after the completion of a major conversion, whichever is later, a vessel under this section that carries crude oil must have—

(1) Segregated ballast tanks that have a total capacity to allow the vessel to meet the draft and trim requirements in §157.09(b); or

(2) A crude oil washing system that meets the design, equipment, and installation requirements of §§157.122 through 157.138.

(c) On January 1, 1986, or 15 years after the date it was delivered to the original owner or 15 years after the completion of a major conversion, whichever is later, a vessel under this section that carries product must have—

(1) Segregated ballast tanks that have total capacity to allow the vessel to meet the draft and trim requirements in §157.09(b); or

(2) Dedicated clean ballast tanks that meet the design and equipment requirements under §§157.220, 157.222, and 157.224 and have total capacity to allow the vessel to meet the draft and trim requirements in §157.09(b).

(d) If the arrangement of tanks on a vessel under this section is such that, when using the tankage necessary to comply with the draft and trim requirements in §157.09(b), the draft amidships exceeds the minimum required draft by more than 10 percent, or the arrangement results in the propeller being fully immersed by more than 10 percent of its diameter, alternative arrangements may be accepted provided—

(1) At least 80 percent of the propeller diameter is immersed; and

(2) The moulded draft amidships is at least 80 percent of that required under §157.09(b)(1).

[CGD 82-28, 50 FR 11626, Mar. 22, 1985; 50 FR 12800, Apr. 1, 1985]

**§ 157.10d Double hulls on tank vessels.**

(a) With the exceptions stated in §157.08(n), this section applies to a tank vessel—

(1) For which the building contract is awarded after June 30, 1990;

(2) That is delivered after December 31, 1993;

(3) That undergoes a major conversion for which;

(i) The contract is awarded after June 30, 1990; or

(ii) Conversion is completed after December 31, 1993; or

(4) That is otherwise required to have a double hull by 46 U.S.C. 3703a(c).

NOTE: The double hull compliance dates of 46 U.S.C. 3703a(c) are set out in appendix G to this part. To determine a tank vessel's double hull compliance date under OPA 90, use the vessel's hull configuration (*i.e.*, single hull; single hull with double sides; or single hull with double bottom) on August 18, 1990.

(b) Each vessel to which this section applies must be fitted with:

(1) A double hull in accordance with this section; and

(2) If §157.10 applies, segregated ballast tanks and a crude oil washing system in accordance with that section.

(c) Except on a vessel to which §157.10d(d) applies, tanks within the cargo tank length that carry any oil must be protected by double sides and a double bottom as follows:

(1) Double sides must extend for the full depth of the vessel's side or from the uppermost deck, disregarding a rounded gunwale where fitted, to the top of the double bottom. At any cross section, the molded width of the double side, measured at right angles to the side shell plating, from the side of tanks containing oil to the side shell plating, must not be less than the distance  $w$  as shown in Figure 157.10d(c) and specified as follows:

(i) For a vessel of 5,000 DWT and above:  $w=[0.5+(DWT/20,000)]$  meters; or,  $w=2.0$  meters (79 in.), whichever is less, but in no case less than 1.0 meter (39 in.).

(ii) For a vessel of less than 5,000 DWT:  $w=[0.4+(2.4)(DWT/20,000)]$  meters, but in no case less than 0.76 meter (30 in.).

(iii) For a vessel to which paragraph (a)(4) of this section applies:  $w=0.76$  meter (30 in.), provided that the double side was fitted under a construction or conversion contract awarded prior to June 30, 1990.

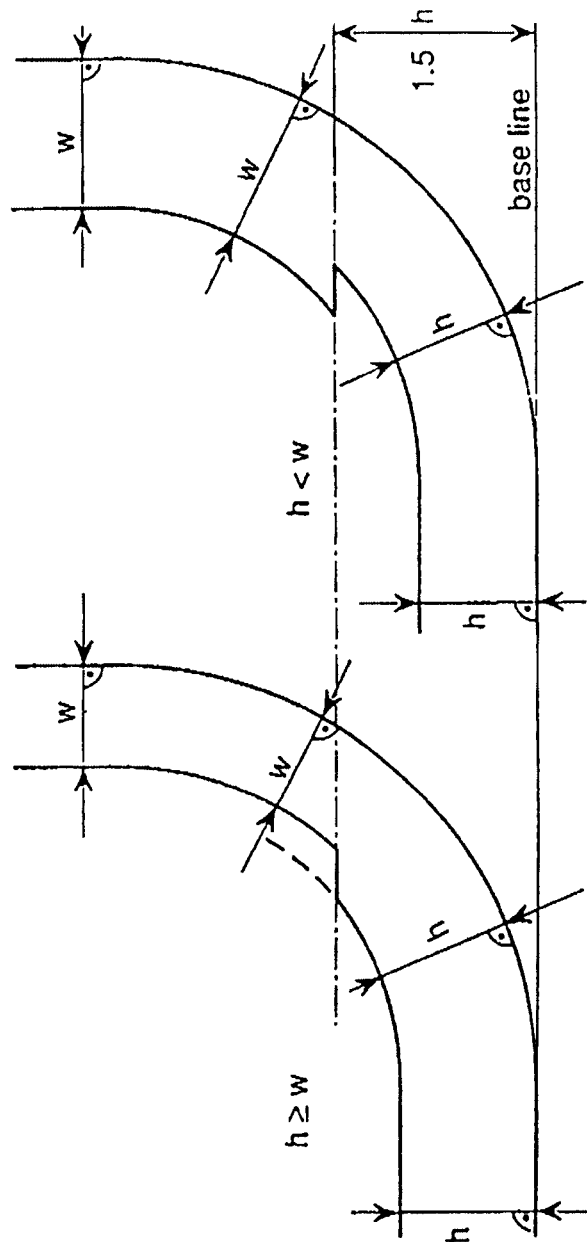


FIGURE 157.10d(c) Minimum Double Hull Dimensions

(2) At any cross section, the molded depth of the double bottom, measured at right angles to the bottom shell plating, from the bottom of tanks con-

taining oil to the bottom shell plating, must not be less than the distance  $h$  as shown in Figure 157.10d(c) and specified as follows:

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(i) For a vessel of 5,000 DWT and above:  $h=B/15$ ; or,  $h=2.0$  meters (79 in.), whichever is less, but in no case less than 1.0 meter (39 in.).

(ii) For a vessel of less than 5,000 DWT:  $h=B/15$ , but in no case less than 0.76 meter (30 in.).

(iii) For a vessel to which paragraph (a)(4) of this section applies:  $h=B/15$ ; or,  $h=2.0$  meters (79 in.), whichever is the lesser, but in no case less than 0.76 meter (30 in.), provided that the double bottom was fitted under a construction or conversion contract awarded prior to June 30, 1990.

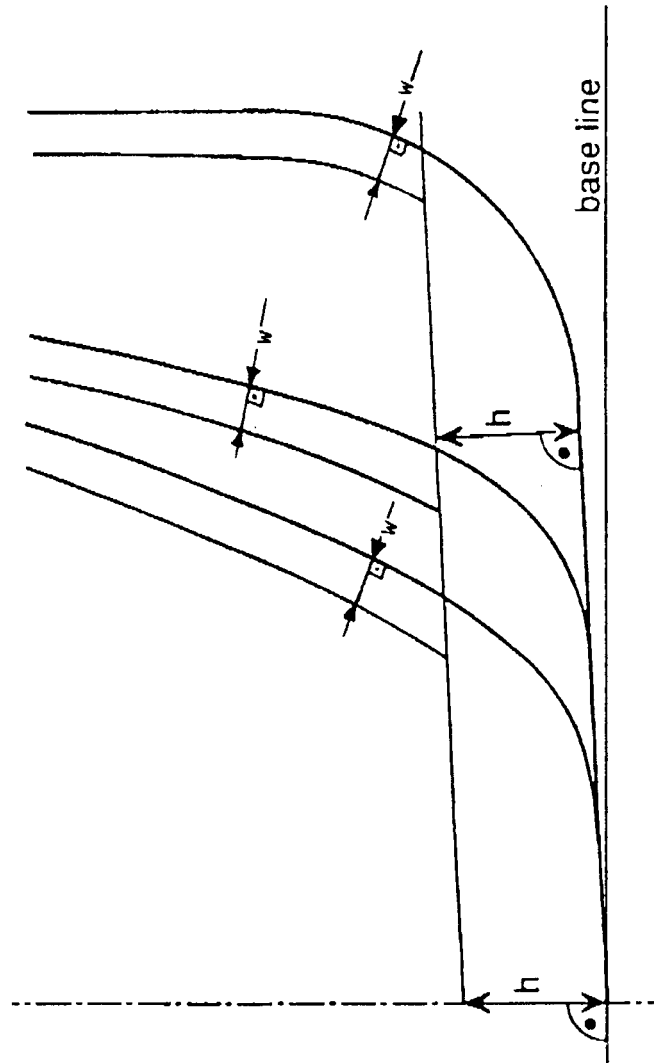
(3) For a vessel built under a contract awarded after September 11, 1992, within the turn of the bilge or at cross sections where the turn of the bilge is not clearly defined, tanks containing oil

must be located inboard of the outer shell—

(i) For a vessel of 5,000 DWT and above: At levels up to  $1.5h$  above the base line, not less than the distance  $h$ , as shown in Figure 157.10d(c) and specified in paragraph (c)(2) of this section. At levels greater than  $1.5h$  above the base line, not less than the distance  $w$ , as shown in Figure 157.10d(c) and specified in paragraph (c)(1) of this section.

(ii) For a vessel of less than 5,000 DWT: Not less than the distance  $h$  above the line of the mid-ship flat bottom, as shown in Figure 157.10d(c)(3)(ii) and specified in paragraph (c)(2) of this section. At levels greater than  $h$  above the line of the mid-ship flat bottom, not less than the distance  $w$ , as shown in Figure 157.10d(c)(3)(ii) and specified in paragraph (c)(1) of this section.

Figure 157.10d(c)(3)(ii) - Minimum Double Hull Dimensions  
Within the Turn of the Bilge of Vessels Under 5,000 DWT



(4) For a vessel to which §157.10(b) applies that is built under a contract awarded after September 11, 1992.

(i) The aggregate volume of the double sides, double bottom, forepeak tanks, and afterpeak tanks must not be less than the capacity of segregated



ballast tanks required under §157.10(b). Segregated ballast tanks that may be provided in addition to those required under §157.10(b) may be located anywhere within the vessel.

(ii) Double side and double bottom tanks used to meet the requirements of §157.10(b) must be located as uniformly as practicable along the cargo tank length. Large inboard extensions of individual double side and double bottom tanks, which result in a reduction of overall side or bottom protection, must be avoided.

(d) A vessel of less than 10,000 DWT that is constructed and certificated for service exclusively on inland or limited short protected coastwise routes must be fitted with double sides and a double bottom as follows:

(1) A minimum of 61 cm. (2 ft.) from the inboard side of the side shell plate, extending the full depth of the side or from the main deck to the top of the double bottom, measured at right angles to the side shell; and

(2) A minimum of 61 cm. (2 ft.) from the top of the bottom shell plating, along the full breadth of the vessel's bottom, measured at right angles to the bottom shell.

(3) For a vessel to which paragraph (a)(4) of this section applies, the width of the double sides and the depth of the double bottom may be 38 cm. (15 in.), in lieu of the dimensions specified in paragraphs (d)(1) and (d)(2) of this section, provided that the double side and double bottom tanks were fitted under a construction or conversion contract awarded prior to June 30, 1990.

(4) For a vessel built under a contract awarded after September 11, 1992, a minimum 46 cm. (18 in.) clearance for passage between framing must be maintained throughout the double sides and double bottom.

(e) Except as provided in paragraph (e)(3) of this section, a vessel must not carry any oil in any tank extending forward of:

(1) The collision bulkhead; or

(2) In the absence of a collision bulkhead, the transverse plane perpendicular to the centerline through a point located:

(i) The lesser of 10 meters (32.8 ft.) or 5 percent of the vessel length, but in no

case less than 1 meter (39 in.), aft of the forward perpendicular;

(ii) On a vessel of less than 10,000 DWT tons that is constructed and certificated for service exclusively on inland or limited short protected coastwise routes, the lesser of 7.62 meters (25 ft.) or 5 percent of the vessel length, but in no case less than 61 cm. (2 ft.), aft of the headlog or stem at the freeboard deck; or

(iii) On each vessel which operates exclusively as a box or trail barge, 61 cm. (2 ft.) aft of the headlog.

(3) This paragraph does not apply to independent fuel oil tanks that must be located on or above the main deck within the areas described in paragraphs (e)(1) and (e)(2) of this section to serve adjacent deck equipment that cannot be located further aft. Such tanks must be as small and as far aft as is practicable.

(f) On each vessel, the cargo tank length must not extend aft to any point closer to the stern than the distance equal to the required width of the double side, as prescribed in §157.10d(c)(1) or §157.10d(d)(1).

[CGD 90-051, 57 FR 36239, Aug. 12, 1992, as amended by USCG-1999-6164, 65 FR 39262, June 23, 2000]

#### §157.11 Pumping, piping and discharge arrangements.

(a) Each tank vessel must have a fixed piping system for transferring cargo residues and other oily mixtures from cargo tanks to slop tanks and for discharging oily mixtures to the sea and to reception facilities. On a vessel that has two or more independent piping arrangements, the arrangements collectively form the fixed piping system required by this paragraph.

(b) Each fixed piping system required by paragraph (a) of this section must have:

(1) At least two manifolds on the weather deck for transferring oily mixtures to reception facilities, one of which is on the port side of the vessel and one of which is on the starboard side; and

(2) Except as provided in paragraph (c) of this section, at least one discharge point that:

(i) Is used for discharges to the sea;

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(ii) Is on a port or starboard weather deck or on the vessel's side above the waterline of its deepest ballast condition; and

(iii) Has an automatic stop valve that is actuated by a cargo monitor signal, except that manual valves may be provided on new vessels of less than 4,000 tons deadweight and on existing vessels.

(c) An above waterline discharge point is not required on an existing vessel if its fixed piping system meets Paragraphs 3 and 4 of Appendix E of this part.

(d) Each tank vessel under §157.09, §157.10a, or §157.10b that carries crude oil must have:

(1) Equipment that drains each cargo pump and oil piping line of oil residue;

(2) Oil piping lines for the draining of oil residue from cargo pumps and other oil piping lines to a cargo tank or a slop tank; and

(3) An oil piping line that meets paragraph (f) of this section and is connected to the cargo discharge piping on the outboard side of the manifold valves for the draining of oil residue from cargo pumps and other oil piping lines to a receptacle on the shore.

(e) Each tank vessel under §157.10 must have:

(1) Oil piping lines that are designed and installed to minimize oil retention in those lines;

(2) Equipment that drains each cargo pump and oil piping line of oil residue;

(3) Oil piping lines for the draining of oil residue from cargo pumps and other oil piping lines to a cargo tank or slop tank; and

(4) An oil piping line that meets paragraph (f) of this section and is connected to the cargo discharge piping on the outboard side of the manifold valves for the draining of oil residue from cargo pumps and other oil piping lines to a receptacle on the shore.

(f) Each oil piping line under paragraph (d)(3) or (e)(4) of this section must have a cross-sectional area of 10 percent or less of the cross-sectional area of the main cargo discharge piping line, except if the oil piping line under paragraph (d)(3) of this section is installed before January 1, 1980, that piping line may have a cross-sectional area of 25 percent or less of the cross-

sectional area of the main cargo discharge piping line.

(g) Each tank vessel to which §157.10d applies that is built under a contract awarded after September 11, 1992 must be arranged so that:

(1) Except for short lengths of completely welded (or equivalent) piping,

(i) Ballast piping and other piping to ballast tanks, such as sounding and vent piping, do not pass through cargo tanks, and

(ii) Cargo piping and other piping to cargo tanks do not pass through ballast tanks;

(2) Suction wells in cargo tanks that protrude into the double bottom are as small as practicable and extend no closer to the bottom shell plating than 0.5*h*, as specified in §157.10d(c)(2) or §157.10d(d)(2), as applicable; and

(3) On a vessel that is constructed and certificated for service exclusively on inland, Great Lakes, or limited short protected coastwise routes, any oil piping that is located within double hull spaces must be placed as far from the outer shell as is practicable and must be fitted with valves at the point of connection to the tank served, to prevent oil outflow in the event of damage to the piping. Such valves must be closed whenever the vessel is underway with any oil in tanks served by the associated piping, except as necessary during transfer operations.

NOTE: Piping location requirements for an oceangoing vessel are in §157.19(d). Related operating requirements are in §157.45.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 80-78, 45 FR 43704, June 30, 1980; CGD 77-058b, 45 FR 43708, June 30, 1980; CGD 79-152, 45 FR 82250, Dec. 15, 1980; CGD 76-088b, 48 FR 45720, Oct. 6, 1983; CGD 90-051, 57 FR 36244, Aug. 12, 1992]

### §157.12 Cargo monitor and control system.

(a) Each vessel must have, for each type of cargo oil that it carries, at least one cargo monitor that is designed for use with that oil.

(b) Each monitor installed on a U.S. vessel must be approved under 46 CFR 162.050. Each monitor installed on a foreign vessel must be approved:

(1) Under 46 CFR 162.050; or

(2) As meeting IMO Resolution A.393(X) by a country that has ratified the MARPOL Protocol.

(c) Each monitor must be installed in accordance with Paragraphs 4, 5, and 6 of Appendix F to this part and be fitted with the control system prescribed by paragraphs 6.1.4.2 through 6.1.4.5.5 of that appendix.

[CGD 76-088b, 48 FR 45720, Oct. 6, 1983, as amended by USCG-1998-3799, 63 FR 35531, June 30, 1998]

#### § 157.13 Designated observation area.

Each new vessel must have a designated observation area on the weather deck or above that is:

(a) Located where the effluent from each discharge point and manifold described in §157.11 can be visually observed; and

(b) Equipped with:

(1) A means to directly stop the discharge of effluent into the sea; or

(2) A positive communication system, such as a telephone or a radio, between the observation area and the discharge control position.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 76-088b, 48 FR 45720, Oct. 6, 1983]

#### § 157.15 Slop tanks in tank vessels.

(a) *Number.* A tank vessel must have the following number of slop tanks that comply with the requirements of this section:

(1) A new vessel of less than 70,000 tons DWT and an existing vessel must have at least one slop tank.

(2) A new vessel of 70,000 tons DWT or more must have at least two slop tanks.

(b) *Capacity.* Slop tanks must have the total capacity to retain slops from tank washings, oil residues, and dirty ballast residues of three percent or more of the oil carrying capacity, except two percent capacity is allowed if there are:

(1) Segregated ballast tanks that meet the requirements in §157.09, §157.10, §157.10a, or §157.10b; or

(2) No eductors arrangements that use water in addition to the washing water.

(c) *Design.* A slop tank required in this section:

(1) Must minimize turbulence, entrainment of oil, and the creation of an emulsion by the use of separate inlet and outlet connections; and

(2) May carry bulk oil when not being used as a slop tank.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §157.15, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and on GPO Access.

#### § 157.17 Oily residue tank.

(a) A tank vessel of 400 gross tons or more must have a tank that receives and holds oily residue resulting from purification of fuel and lubricating oil and from oil leakages in machinery spaces.

(b) Each oily residue tank required in paragraph (a) of this section must have an adequate capacity that is determined by the:

(1) Type of machinery installed on the vessel; and

(2) Maximum fuel oil capacity.

(c) Each oily residue tank on a new vessel must be designed to facilitate:

(1) Cleaning; and

(2) Discharging to a reception facility.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 80-78, 45 FR 43704, June 30, 1980]

#### § 157.19 Cargo tank arrangement and size.

(a) This section applies to:

(1) A U.S. or foreign vessel that is delivered after January 1, 1977;

(2) A U.S. vessel that is delivered before January 1, 1977, for which the building contract is awarded after January 1, 1972, or, if there is no building contract, the keel is laid or the vessel is at a similar stage of construction after June 30, 1972; and

(3) A foreign vessel that is delivered before January 1, 1977, for which the building contract is awarded after January 1, 1974, or, if there is no building contract, the keel is laid or the vessel is at a similar stage of construction after June 30, 1974.

(b) As determined in accordance with the procedures contained in Appendix A of this part, each cargo tank must be of such size and arrangement that:

(1) The hypothetical outflow for side damage ( $O_c$ ) or for bottom damage ( $O_s$ ) anywhere within the length of the vessel must not exceed  $O_A$  (30,000 cubic

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meters or  $(400) \times (\sqrt[3]{\text{DWT}})$  whichever is greater, limited to a maximum of 40,000 cubic meters);

(2) The volume of each wing tank and center tank is less than the allowable volume of a wing tank ( $\text{VOL}_W$ ) and the allowable volume of a center tank ( $\text{VOL}_C$ ) respectively; and

(3) The length of a tank is less than the allowable length of a tank ( $l_a$ ).

(c) If a cargo transfer system interconnects two or more cargo tanks, the system must have valves to segregate the tanks from each other.

(d) If a line of piping that runs through a cargo tank in a position less than  $t_c$  from the vessel's side or less than  $v_s$  from the vessel's bottom as defined in Appendix A of this part, has a branch, that branch must have a stop valve:

(1) Within each cargo tank into which the branch opens; or

(2) Outside each tank into which the branch opens in a location that is immediately adjacent to the point at which the branch enters the tank.

(e) If piping that serves suction wells is installed within a double bottom, that piping must be:

(1) Fitted with valves located at the point of connection to the tank served to prevent oil outflow in the event of damage to the piping; and

(2) Designed to be installed as high from the bottom shell as possible.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 75-240, 41 FR 54180, Dec. 13, 1976; CGD 76-088b, 48 FR 45720, Oct. 6, 1983; USCG-2000-7223, 65 FR 40058, June 29, 2000]

### § 157.21 Subdivision and stability.

A new vessel that is a U.S. vessel must meet the following subdivision and damage stability criteria after assuming side and bottom damages, as defined in Appendix B of this Part. A U.S. vessel that meets the requirements in this section is considered by the Coast Guard as meeting 46 CFR 42.20-5.

(a) The final waterline, taking into account sinkage, heel, and trim, must be below the lower edge of an opening through which progressive flooding may take place, such as an air pipe, or any opening that is closed by means of a weathertight door or hatch cover.

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This opening does not include an opening closed by a:

(1) Watertight manhole cover;

(2) Flush scuttle;

(3) Small watertight cargo tank hatch cover that maintains the high integrity of the deck;

(4) Remotely operated watertight sliding door; or

(5) Side scuttle of the non-opening type.

(b) In the final stage of flooding, the angle of heel due to unsymmetrical flooding must not exceed 25 degrees, except that this angle may be increased to 30 degrees if no deck edge immersion occurs.

(c) For acceptable stability in the final stage of flooding, the righting lever curve must have a range of at least 20 degrees beyond the position of equilibrium in association with a maximum residual righting lever of at least 0.1 meter. For the calculations required in this section, weathertight openings or openings fitted with automatic closures (e.g., a vent fitted with a ball check valve), need not be considered as points of downflooding within the range of residual stability, but other openings must be accounted for in the calculation.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 75-240, 41 FR 54180, Dec. 13, 1976]

### § 157.23 Cargo and ballast system information.

(a) Each tank vessel to which this part applies must have an instruction manual that describes the automatic and manual operation of the cargo and ballast system in the vessel.

(b) The format and information contained in the instruction manual required in paragraph (a) of this section must be similar to the manual entitled "Clean Seas Guide for Oil Tankers" which can be obtained from the International Chamber of Shipping, 30-32 St. Mary Axe, London, England, EC3A 8ET.

### § 157.24 Submission of calculations, plans, and specifications.

The owner, builder or designer of a new vessel to which this part applies shall submit the documentation specified in this section to the Coast Guard before that vessel enters the navigable

waters of the United States. The owner, builder, or designer of a vessel that must comply with §157.10d shall submit the documentation specified in this section to the Coast Guard before that vessel enters the navigable waters of the United States or the U.S. Exclusive Economic Zone.

(a) Calculations to substantiate compliance with the tank arrangement and size requirements under §157.19, or a letter from the government of the vessel's flag state that certifies compliance with:

(1) Section 157.19; or

(2) Regulations 24 of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973.

(b) Except for a new vessel that is a foreign vessel, calculations to substantiate compliance with subdivisions and damage stability requirements under §157.21.

(c) Plans and calculations to substantiate compliance with the applicable segregated ballast and double hull requirements in §§157.09, 157.10, 157.10a, 157.10b, or 157.10d, or certification from the government of the vessel's flag state that the vessel complies with the segregated ballast and double hull requirements in:

(1) Sections 157.09, 157.10, 157.10a, 157.10b, or 157.10d, as applicable; or

(2) For a vessel to which §157.10d does not apply, Regulations 13 and 13E of the MARPOL Protocol.

(d) Plans and specifications for the vessel that include:

(1) Design characteristics;

(2) A lines plan;

(3) Curves of form (hydrostatic curves) or hydrostatic tables;

(4) A general arrangement plan of each deck and level;

(5) Inboard and outboard profile plans showing oiltight and watertight bulkheads;

(6) A midship section plan;

(7) A capacity plan showing the capacity and the vertical and longitudinal centers of gravity of each cargo space, tank, and similar space;

(8) Tank sounding tables or tank capacity tables;

(9) Draft mark locations;

(10) Detailed plans of watertight doors; and

(11) Detailed plans of vents.

[CGD 75-240, 41 FR 54180, Dec. 13, 1976, as amended by CGD 77-058b, 45 FR 43708, June 30, 1980; CGD 79-152, 45 FR 82250, Dec. 15, 1980; CGD 90-051, 57 FR 36244, Aug. 12, 1992]

**§ 157.24a Submission of calculations, plans, and specifications for existing vessels installing segregated ballast tanks.**

(a) Before modifications are made to a U.S. tank vessel to meet §157.10a(a)(1), §157.10a(c)(1), §157.10c(b)(1), or §157.10c(c)(1), the vessel's owner or operator must submit the following to the Officer in Charge, Marine Inspection, of the zone where the modification will be made or to the appropriate Coast Guard technical office listed in 157.100(b):

(1) A drawing or diagram of the pumping and piping system for the segregated ballast tanks.

(2) A drawing of the segregated ballast tank arrangement.

(3) Documentation, calculations, or revised stability information to show that the vessel, with the addition of the segregated ballast tanks, meets the stability standards for load line assignment in 46 CFR Part 42.

(4) Documentation, calculations, or a revised loading manual to show that the vessel, with the addition of the segregated ballast tanks, meets the structural standards in 46 CFR Part 32.

(5) Plans and calculations to show that the vessel, as modified, complies with the segregated ballast capacity and distribution requirements in §157.10a.

(b) Before each foreign vessel under §157.10a(a)(1) or §157.10a(c)(1) enters the navigable waters of the United States, the owner or operator of that vessel must—

(1) Submit to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001—

(i) A letter from the authority that assigns the load line to the vessel finding that the location of the segregated ballast tanks is acceptable; and

(ii) Plans and calculations to substantiate compliance with the segregated ballast capacity requirements in §157.09(b); or

(2) Submit to the Officer in Charge, Marine Inspection, of the zone in which

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the first U.S. port call is made, a letter or document from the government of vessel's flag state certifying that the vessel complies with the segregated ballast capacity requirements in §157.09(b) or Regulation 13 of the MARPOL Protocol.

(c) On January 1, 1986, or 15 years after the date it was delivered to the original owner, or 15 years after the completion of a major conversion, whichever is later, before that vessel enters the navigable waters of the United States, the owner or operator of an existing foreign vessel under §157.10c(b)(1) or §157.10c(c)(1) must—

(1) Submit to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001—

(i) A letter from the authority that assigns the load line to the vessel finding that the location of the segregated ballast tanks is acceptable; and

(ii) Plans and calculations to substantiate compliance with the applicable segregated ballast capacity requirements in §157.09(b) or §157.10c(d); or

(2) Submit to the Officer in Charge, Marine Inspection, of the zone in which the first U.S. port call is made a letter from an authorized CS or the government of the vessel's flag state certifying that the vessel complies with the segregated ballast capacity requirements in §157.09(b) or §157.10c(d).

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11626 and 11630, Mar. 22, 1985, as amended by CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

### Subpart C—Vessel Operation

#### § 157.25 Applicability of subpart C.

(a) This subpart applies to each vessel to which this part applies of 150 gross tons or more, unless otherwise indicated, that carries crude oil or products in bulk as cargo. This subpart does not apply to a foreign vessel which remains beyond the navigable waters of the United States and does not transfer oil cargo at a port or place subject to the jurisdiction of the United States.

(b) Sections 157.29, 157.31, 157.37(a)(5), 157.37(a)(6) and 157.43 apply to foreign

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vessels when they discharge into the navigable waters of the United States.

(c) Sections 157.35, 157.37, except paragraphs (a)(5) and (a)(6), 157.39, 157.45, and 157.47 do not apply to foreign vessels.

[CGD 76-088b, 48 FR 45720, Oct. 6, 1983, as amended by CGD 90-051, 57 FR 36244, Aug. 12, 1992]

#### § 157.26 Operation of a tank vessel in violation of regulations.

No person may cause or authorize the operation of a tank vessel in violation of the regulations in this part.

[CGD 77-058b, 45 FR 43708, June 30, 1980]

#### § 157.27 Discharges: Tank vessels carrying oil exclusively on rivers, lakes, bays, sounds, and the Great Lakes, and seagoing tank vessels of less than 150 gross tons.

Unless a tank vessel carrying oil exclusively on rivers, lakes, bays, sounds, and the Great Lakes, or a seagoing tank vessel of less than 150 gross tons discharges clean ballast or segregated ballast, the vessel must:

(a) Retain on board any oily mixture; or

(b) Transfer an oily mixture to a reception facility.

#### § 157.28 Discharges from tank barges exempted from certain design requirements.

The person in charge of a tank barge exempted under §157.08(g) from the requirements in §§157.11, 157.13, 157.15, and 157.23 shall ensure that while the barge is proceeding en route:

(a) Cargo tanks are not ballasted or washed; and

(b) Oil or oily mixtures are not discharged.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 76-088b, 48 FR 45721, Oct. 6, 1983; CGD 90-051, 57 FR 36244, Aug. 12, 1992]

#### § 157.29 Discharges: Seagoing tank vessels of 150 gross tons or more.

Unless a seagoing tank vessel of 150 gross tons or more discharges an oily mixture in compliance with the requirements in §157.37, §157.39, or §157.43, the vessel must:

(a) Retain the mixture; or

(b) Transfer the mixture to a reception facility.

**§ 157.31 Discharges: Chemical additives.**

No person may use a chemical additive to circumvent the discharge requirements in §§157.27, 157.29, 157.37, 157.39, and 157.43.

**§ 157.33 Water ballast in oil fuel tanks.**

A new vessel may not carry ballast water in an oil fuel tank.

**§ 157.35 Ballast added to cargo tanks.**

The master of a tank vessel with segregated ballast tanks or dedicated clean ballast tanks under §157.09, §157.10, §157.10a(a)(1), §157.10a(b), §157.10a(c), §157.10b(a), §157.10c(b)(1), or §157.10c(c) shall ensure that ballast water is carried in a cargo tank only if—

- (a) The vessel encounters abnormally severe weather conditions;
- (b) More ballast water than can be carried in segregated ballast tanks or dedicated clean ballast tanks is necessary for the safety of the vessel;
- (c) The ballast water is processed and discharged in compliance with §157.37; and
- (d) On a new vessel under §157.10 that carries crude oil, the ballast water is only carried in a cargo tank that is crude oil washed in accordance with Subpart D of this part during or after the most recent discharge of crude oil from that tank.

[CGD 77-058b, 45 FR 43708, June 30, 1980, as amended by CGD 82-28, 50 FR 11626, Mar. 22, 1985]

**§ 157.37 Discharge of cargo residue.**

(a) A tank vessel may not discharge an oily mixture into the sea from a cargo tank, slop tank, or cargo pump room bilge unless the vessel:

- (1) Is more than 50 nautical miles from the nearest land;
- (2) Is proceeding en route;
- (3) Is discharging at an instantaneous rate of oil content not exceeding 60 liters per nautical mile;
- (4) Is an existing vessel and the total quantity of oil discharged into the sea does not exceed 1/15,000 of the total quantity of the cargo that the discharge formed a part, or is a new vessel and the total quantity of oil discharged

into the sea does not exceed 1/30,000 of the total quantity of the cargo that the discharge formed a part;

(5) Discharges:

(i) Through the above waterline discharge point described in §157.11(b)(2);

(ii) In accordance with Paragraph 5 of Appendix E to this part, if the vessel is an existing vessel with a Part Flow System meeting that appendix; or

(iii) Below the waterline in accordance with paragraph (e) of this section;

(6) Has in operation a cargo monitor and control system required by §157.12 that is designed for use with the oily mixture being discharged, except that the system may be operated manually if:

(i) The automatic system fails during a ballast voyage;

(ii) The failure is recorded in the Oil Record Book;

(iii) The master ensures that the discharge is constantly monitored visually and promptly terminated when oil is detected in the discharge; and

(iv) The system is operated manually only until the ballast voyage is completed; and

(7) Is outside the "Special Areas" defined in Regulation 1 (10) of Annex I to the MARPOL Protocol.

(b) A seagoing tank vessel of 150 gross tons or more that carries asphalt or other products whose physical properties inhibit effective product/water separation and monitoring must transfer all residues and tank washings from such cargoes to a reception facility.

(c) Each cargo monitor must be maintained and operated in accordance with its instructions manual.

(d) All discharge data recorded by a cargo monitor must be retained for at least three years. The data for the most recent year must be retained on board the vessel.

(e) Ballast containing an oily mixture may be discharged below the waterline at sea by gravity if:

(1) The ballast is not from a slop tank;

(2) Examination with an oil-water interface detector shows that oil-water separation has taken place; and

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(3) The oil layer is high enough in the tank so that it will not be discharged.

(The information collection requirement contained in paragraph (d) of this section was approved by the Office of Management and Budget under OMB control number 2115-0518)

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 76-088b, 48 FR 45721, Oct. 6, 1983]

**§ 157.39 Machinery space bilges.**

(a) A tank vessel may discharge an oily mixture from a machinery space bilge that is combined with an oil cargo mixture if the vessel discharges in compliance with § 157.37.

(b) A tank vessel may discharge an oily mixture from a machinery space bilge that is not combined with an oil cargo mixture if the vessel:

- (1) Is more than 12 nautical miles from the nearest land;
- (2) Is proceeding en route;
- (3) Is discharging an effluent with an oil content of less than 100 parts per million; and
- (4) Has in operation an oil discharge monitoring and control system approved by the Coast Guard (specification regulation to be proposed) and oil water separating equipment approved by the Coast Guard (specification regulation to be proposed).

**§ 157.41 Emergencies.**

Sections 157.27, 157.29, 157.37, and 157.39 do not apply to a tank vessel that discharges into the sea oil or oily mixtures:

(a) For the purpose of securing the safety of the vessel or for saving life at sea; or

(b) As a result of damage to the vessel or its equipment if:

- (1) Reasonable precautions are taken after the occurrence of the damage or discovery of the discharge for the purpose of preventing or minimizing the discharge; and
- (2) The owner, master or person in charge did not intend to cause damage, or did not act recklessly and with knowledge that damage of the environment would probably result.

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**§ 157.43 Discharges of clean and segregated ballast: Seagoing tank vessels of 150 gross tons or more.**

(a) Clean ballast may not be discharged overboard unless the discharge is verified as clean ballast through use of an approved cargo monitor or, if discharged before the required cargo monitor installation date, by visual examination of the ballast contents immediately before discharge. This paragraph applies to discharges of clean ballast:

- (1) From dedicated clean ballast tanks; and
- (2) Into the navigable waters of the United States from any other tank.

(b) Segregated ballast may not be discharged overboard unless a visual examination, or a test of the ballast contents with an oil/water interface detector, immediately before the discharge shows that there is no oil mixture in the ballast. Use of a cargo monitor is not required. This paragraph applies to discharges of segregated ballast:

- (1) Into the navigable waters of the United States; and
- (2) Below the waterline at sea from an existing vessel that does not have an above the waterline discharge point for segregated ballast.

(c) All discharges of clean ballast and segregated ballast must be through an above waterline discharge point described in § 157.11(b)(2), except that:

(1) A vessel may discharge clean ballast and segregated ballast below the waterline when in port or at an off-shore terminal.

(2) A vessel may discharge clean ballast and segregated ballast at sea by gravity below the waterline.

(3) An existing vessel that does not have above waterline discharge points for dedicated clean ballast tanks may discharge clean ballast from those tanks below the waterline at sea.

(4) An existing vessel that does not have above waterline discharge points for segregated ballast tanks may discharge segregated ballast below the waterline at sea.

(d) This section applies only to seagoing tank vessels of 150 gross tons or more.

[CGD 76-088b, 48 FR 45721, Oct. 6, 1983; 48 FR 46985, Oct. 17, 1983]



**§ 157.45 Valves in cargo or ballast piping system.**

When a tank vessel is at sea and the tanks contain oil, valves and closing devices in the cargo or ballast piping system or in the transfer system must be kept closed except they may be opened for cargo or ballast transfer to trim the vessel.

**§ 157.47 Information for master.**

A master or person in charge of a new vessel shall operate the vessel in accordance with the information required in 46 CFR 31.10–30(d) that includes the following:

- (a) Stability information.
- (b) Damage stability information determined in accordance with the criteria contained in Appendix B of this part.
- (c) Loading and distribution of cargo information determined in compliance with the damage stability criteria required in Appendix B of this part.

[CGD 74–32, 40 FR 48283, Oct. 14, 1976, as amended by CGD 75–240, 41 FR 54180, Dec. 13, 1976]

**§ 157.49 Instruction manual.**

The master of a tank vessel shall ensure that the instruction manual under § 157.23 is available and used when the cargo or ballast systems are operated.

**Subpart D—Crude Oil Washing (COW) System on Tank Vessels**

SOURCE: CGD 77–058b, 45 FR 43709, June 30, 1980, unless otherwise noted.

## GENERAL

**§ 157.100 Plans for U.S. tank vessels: Submission.**

(a) Before each U.S. tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) is inspected under § 157.140, the owner or operator of that vessel must submit to the Coast Guard plans that include—

- (1) A drawing or diagram of the COW pumping and piping system that meets 46 CFR 56.01–10(d);
- (2) The design of each COW machine;
- (3) The arrangement, location, and installation of the COW machines; and

(4) Except as allowed in § 157.104, the projected direct impingement pattern of crude oil from the nozzles of the COW machines on the surfaces of each tank, showing the surface areas not reached by direct impingement.

(b) Plans under paragraph (a) of this section must be submitted to the Officer in Charge, Marine Inspection, of the zone in which the COW system is installed or to the Commanding Officer, U.S. Coast Guard Marine Safety Center, 400 7th Street, SW., Washington, DC 20590–0001.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115–0520)

[CGD 77–058b, 45 FR 43709, June 30, 1980, as amended by CGD 82–28, 50 FR 11626 and 11630, Mar. 22, 1985; CDG 85–048a, 51 FR 15481, Apr. 24, 1986; USCG–1998–3799, 63 FR 35531, June 30, 1998]

**§ 157.102 Plans for foreign tank vessels: Submission.**

If the owner or operator of a foreign tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2), desires the letter from the Coast Guard under § 157.106 accepting the plans submitted under this paragraph, the owner or operator must submit to the Commandant (G–MOC), U.S. Coast Guard, Washington, DC 20593–0001, plans that include—

- (a) A drawing or diagram of the COW pumping and piping system that meets 46 CFR 56.01–10(d);
- (b) The design of each COW machine;
- (c) The arrangement, location, and installation of the COW machines; and
- (d) Except as allowed in § 157.104, the projected direct impingement pattern of crude oil from the nozzles of the COW machines on the surfaces of each tank, showing the surface areas not reached by direct impingement.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115–0520)

[CGD 77–058b, 45 FR 43709, June 30, 1980, as amended by CGD 82–28, 50 FR 11627 and 11630, Mar. 22, 1985; CGD 88–052, 53 FR 25122, July 1, 1988; CGD 96–026, 61 FR 33668, June 28, 1996]

**§ 157.104 Scale models.**

If the pattern under § 157.100(a)(4) or § 157.102(d) cannot be shown on a plan, a scale model of each tank must be built

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for Coast Guard inspection to simulate, by a pinpoint of light, the projected direct impingement pattern on the surfaces of the tank.

### § 157.106 Letter of acceptance.

The Coast Guard informs the submitter by letter that the plans submitted under § 157.100 or § 157.102 are accepted if:

(a) The plans submitted show that the COW system meets this subpart; or

(b) The plans submitted and the scale model under § 157.104 show that the COW system meets this subpart.

### § 157.108 Crude Oil Washing Operations and Equipment Manual for U.S. tank vessels: Submission.

Before each U.S. tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) is inspected under § 157.140, the owner or operator of that vessel must submit two copies of a manual that meets § 157.138, to the Officer in Charge, Marine Inspection, of the zone in which the COW system is installed or to the appropriate Coast Guard field technical office listed in § 157.100(b).

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11627 and 11630, Mar. 22, 1985]

### § 157.110 Crude Oil Washing Operations and Equipment Manual for foreign tank vessels: Submission.

If the owner or operator of a foreign tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) desires a Coast Guard approved *Crude Oil Washing Operations and Equipment Manual* under § 157.112, the owner or operator must submit two copies of a manual that meets § 157.138 to the Commandant (G-MOC), U.S. Coast Guard, Washington, DC 20593-1000.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11627 and 11630, Mar. 22, 1985, as amended by CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

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### § 157.112 Approved Crude Oil Washing Operations and Equipment Manual.

If the manuals submitted under § 157.108 or § 157.110 meet § 157.138, the Coast Guard approves the manuals and forwards one of the approved manuals to the submitter.

### § 157.114 Crude Oil Washing Operations and Equipment Manual: Not approved.

If the manuals submitted under § 157.108 or § 157.110 are not approved, the Coast Guard forwards a letter to the submitter with the reasons why the manuals were not approved.

### § 157.116 Required documents: U.S. tank vessels.

The owner, operator, and master of a U.S. tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) shall ensure that the vessel does not engage in a voyage unless the vessel has on board the following:

(a) The *Crude Oil Washing Operations and Equipment Manual* that—

(1) Is approved under § 157.112; or

(2) Bears a certification by an authorized CS that the manual contains the information required under § 157.138.

(b) Evidence of acceptance of the tank vessel's COW system consisting of—

(1) A document from an authorized CS that certifies the vessel meets § 157.10c(b)(2) and each amending letter by the authorized CS approving changes in the design, equipment, or installation; or

(2) The letter of acceptance under § 157.106 and each amending letter issued under § 157.158(c).

(c) Evidence that the COW system passed the required inspections by—

(1) A document from an authorized CS that the vessel has passed the inspections under § 157.140; or

(2) The letter of acceptance under § 157.142 after passing the inspection under § 157.140.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11627 and 11630, Mar. 22, 1985]

**§ 157.118 Required documents: Foreign tank vessels.**

(a) The owner, operator, and master of a foreign tank vessel under § 157.10(e) or § 157.10a(a)(2) shall ensure that the vessel does not enter the navigable waters of the United States or transfer cargo at a port or place subject to the jurisdiction of the United States unless the vessel has on board—

(1) The *Crude Oil Washing Operations and Equipment Manual* that—

(i) Is approved under § 157.112; or

(ii) Meets the manual standards in Resolution 15 of the MARPOL Protocol and bears the approval of the government of the vessel's flag state; and

(2) Either—

(i) A document from the government of the vessel's flag state that certifies that the vessel complies with Resolution 15 of the MARPOL Protocol; or

(ii) The following letters issued by the Coast Guard:

(A) The letter of acceptance issued under § 157.106.

(B) The letter of acceptance issued under § 157.142.

(C) Each amending letter issued under § 157.158(c).

(b) On January 1, 1986, or 15 years after the date it was delivered to the original owner or 15 years after the completion of a major conversion, whichever is later, the owner, operator, and master of a foreign vessel having a COW system under § 157.10c(b)(2) shall ensure that the vessel does not enter the navigable waters of the United States or transfer cargo at a port or place subject to the jurisdiction of the United States unless the vessel has on board—

(1) The *Crude Oil Washing Operations and Equipment Manual* that—

(i) Is approved under § 157.112; or

(ii) Bears a certification by an authorized CS or the government of the vessel's flag state that the manual contains the information required under § 157.138;

(2) Evidence that the COW system passed the required inspections by—

(i) A document from an authorized CS or the government of the vessel's flag state certifying that the vessel passed the inspections under § 157.140; or

(ii) The letter of acceptance under § 157.142 after passing the inspection under § 157.140; and

(3) Either—

(i) A document from an authorized CS or the government of the vessel's flag state certifying that the vessel complies with the design, equipment and installation standards in §§ 157.122 through 157.136 and any amending letters approving changed COW system characteristics; or

(ii) The letter of acceptance under § 157.106 and any amending letters issued under § 157.158(c).

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11627 and 11630, Mar. 22, 1985]

**§ 157.120 Waiver of required documents.**

The Coast Guard waives the requirement for the letter under § 157.116(b), if a U.S. tank vessel engages in a voyage, or under § 157.118(b)(2)(ii), if a foreign tank vessel enters the navigable waters of the United States or transfers cargo at a port or place subject to the jurisdiction of the United States, for the purpose of being inspected under § 157.140.

## DESIGN, EQUIPMENT, AND INSTALLATION

**§ 157.122 Piping, valves, and fittings.**

(a) Except as allowed in paragraph (o) of this section, the piping, valves, and fittings of each COW system must:

(1) Meet 46 CFR Part 56; and

(2) Be of steel or an equivalent material accepted by the Commandant.

(b) The piping of each COW system must be permanently installed.

(c) The piping of each COW system must be separate from other piping systems on the vessel, except that the vessel's cargo piping may be a part of the COW piping if the cargo piping meets this section.

(d) The piping of each COW system must have overpressure relief valves or other means accepted by the Commandant to prevent overpressure in the piping of the COW system, unless the maximum allowable working pressure of that system is greater than the shut-

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off head of each pump that meets §157.126(b).

(e) Each overpressure relief valve must discharge into the suction side of a pump that meets §157.126(b).

(f) The piping and equipment of a COW system may not be in machinery spaces.

(g) Each hydrant valve for water washing in the piping of a COW system must:

(1) Have adequate strength to meet 46 CFR Part 56 for the working pressure for which the system is designed; and

(2) Be capable of being blanked off.

(h) Each sensing instrument must have an isolating valve at its connection to the piping of the COW system, unless the opening to that connection is 0.055 inches (1.4 millimeters) or smaller.

(i) If the washing system for cargo tanks has a steam heater used when water washing, it must be located outside the engine room and must be capable of being isolated from the piping of the COW system by:

(1) At least two shut-off valves in the inlet piping and at least two shut-off valves in the outlet piping; or

(2) Blank flanges identifiable as being closed (e.g., spectacle flanges).

(j) If the COW system has a common piping system for oil washing and water washing, that piping system must be designed to drain the crude oil into a slop tank or a cargo tank.

(k) The piping of a COW system must be securely attached to the tank vessel's structure with pipe anchors.

(l) When COW machines are used as pipe anchors, there must be other means available for anchoring the piping if these machines are removed.

(m) There must be a means to allow movement of the COW system piping as a result of thermal expansion and flexing of the tank vessel.

(n) The supply piping attached to each deck mounted COW machine and each COW machine that is audio inspected under §157.155(a)(4)(ii) must have a shut-off valve.

(o) On combination carriers, piping of the COW system installed between each COW machine located in a cargo tank hatch cover and an adjacent location just outside the hatch coaming, may be

flexible hose with flanged connections that is acceptable by the Commandant.

**§ 157.124 COW tank washing machines.**

(a) COW machines must be permanently mounted in each cargo tank.

(b) The COW machines in each tank must have sufficient nozzles with the proper diameter, working pressure, movement, and timing to allow the tank vessel to pass the inspections under §157.140.

(c) Each COW machine and its supply piping must be supported to withstand vibration and pressure surges.

(d) There must be one portable drive unit available on board the vessel for every three COW machines that use portable drive units during COW operations required by §157.160 before each ballast voyage.

(e) Except as allowed in paragraph (f) of this section, each cargo tank must have COW machines located to wash all horizontal and vertical areas of the tank by direct impingement, jet deflection, or splashing to allow the tank vessel to pass the inspections under §157.140. The following areas in each tank must not be shielded from direct impingement by large primary structural members or any other structural member determined to be equivalent to a large primary structural member by the Commandant when reviewing the plans submitted under §157.100 or §157.102:

(1) 90 percent or more of the total horizontal area of the:

(i) Tank bottom;

(ii) Upper surfaces of large primary structural members; and

(iii) Upper surfaces of any other structural member determined to be equivalent to a large primary structural member by the Commandant.

(2) 85 percent or more of the total vertical area of the tank sides and swash bulkheads.

(f) Each cargo tank on a vessel having a COW system under §157.10a(a)(2) or §157.10c(b)(2) with complicated internal structural members does not have to meet paragraph (e) of this section if the following areas of each cargo tank are washed by direct impingement and the tank vessel can pass the inspections under §157.140:

(1) 90 percent or more of the total horizontal area of all the:

- (i) Tank bottoms;
- (ii) Upper surfaces of large primary structural members; and
- (iii) Upper surfaces of any other structural member determined to be equivalent to a large primary structural member by the Commandant.

(2) 85 percent or more of the total vertical area of all the tank sides and swash bulkheads.

(g) Each single nozzle COW machine that is mounted to the deck must have a means located outside of the cargo tank that indicates the arc and rotation of the movement of the COW machine during COW operations.

(h) Each multi-nozzle COW machine that is mounted to the deck must have a means located outside of the cargo tank that indicates the movement of the COW machine during COW operations.

(i) Each COW machine mounted to or close to the bottom of a tank without a means located outside of the cargo tank that indicates movement of the machine must not be programmable.

NOTES: 1. In the calculations to meet §157.124 (e) or (f), areas that are shielded from direct impingement by structural members other than large primary structural members or swash bulkheads can be calculated as areas being washed by direct impingement.

2. One or more types of COW machines could be used to meet §157.124 (e) or (f).

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11627, Mar. 22, 1985]

#### § 157.126 Pumps.

(a) Crude oil must be supplied to the COW machines by COW system pumps or cargo pumps.

(b) The pumps under paragraph (a) of this section must be designed and arranged with sufficient capacity to meet the following:

(1) A sufficient pressure and flow is supplied to allow the simultaneous operation of those COW machines designed to operate simultaneously.

(2) If an eductor is used for tank stripping, enough driving fluid is provided by the pumps to allow the eductor to meet §157.128(a).

(c) There must be means on the tank vessel to maintain the pressure under

paragraph (b) of this section when shore terminal back pressure is less than the pressure under paragraph (b) of this section.

(d) The COW system must have two or more pumps that are capable of supplying oil to the COW machines.

(e) The COW system must be designed to meet the requirements of this subpart with any one pump not operating.

#### § 157.128 Stripping system.

(a) Each tank vessel having a COW system under §157.10(e), §157.10a(a)(2), or §157.10c(b)(2) must have a stripping system that is designed to remove crude oil from—

(1) Each cargo tank at 1.25 times the rate at which all the COW machines that are designed to simultaneously wash the bottom of the tank, are operating; and

(2) The bottom of each tank to allow the tank vessel to pass the inspection under §157.140(a)(2).

(b) Each cargo tank must be designed to allow the level of crude oil in the tank to be determined by:

(1) Hand dipping at the aftermost portion of the tank and three other locations; or

(2) Any other means accepted by the Commandant.

(c) Each stripping system must have at least one of the following devices for stripping oil from each cargo tank:

(1) A positive displacement pump.

(2) A self-priming centrifugal pump.

(3) An eductor

(4) Any other device accepted by the Commandant.

(d) There must be a means in the stripping system piping between the device under paragraph (c) of this section and each cargo tank to isolate each tank from the device.

(e) If the stripping system has a positive displacement pump or a self-priming centrifugal pump, the stripping system must have the following:

(1) In the stripping system piping:

(i) A pressure gauge at the inlet connection to the pump; and

(ii) A pressure gauge at the discharge connection to the pump.

(2) At least one of the following monitoring devices to indicate operation of the pump.

(i) Flow indicator.

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- (ii) Stroke counter.
- (iii) Revolution counter.

(f) If the stripping system has an eductor, the stripping system must have:

- (1) A pressure gauge at each driving fluid intake and at each discharge; and
- (2) A pressure/vacuum gauge at each suction intake.

(g) The equipment required under paragraphs (e) and (f) of this section must have indicating devices in the cargo control room or another location that is accepted by the Commandant.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11627, Mar. 22, 1985]

### § 157.130 Crude oil washing with more than one grade of crude oil.

If a tank vessel having a COW system under §§ 157.10(e), 157.10a(a)(2), or 157.10c(b)(2) carries more than one grade of crude oil, the COW system must be capable of washing the cargo tanks with the grades of crude oil that the vessel carries.

[CGD 82-28, 50 FR 11627, Mar. 22, 1985]

### § 157.132 Cargo tanks: Hydrocarbon vapor emissions.

Each tank vessel having a COW system under § 157.10a(a)(2) or § 157.10c(b)(2) without sufficient segregated ballast tanks or dedicated clean ballast tanks to allow the vessel to depart from any port in the United States without ballasting cargo tanks must have—

- (a) A means to discharge hydrocarbon vapors from each cargo tank that is ballasted to a cargo tank that is discharging crude oil; or
- (b) Any other means accepted by the Commandant that prevents hydrocarbon vapor emissions when the cargo tanks are ballasted in port.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

### § 157.134 Cargo tank drainage.

Each cargo tank must be designed for longitudinal and transverse drainage of crude oil to allow the tank vessel to pass the inspections under § 157.140.

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### § 157.136 Two-way voice communications.

Each tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) must have a means that enables two-way voice communications between the main deck watch required under § 157.168 and each cargo discharge control station.

[CGD 82-28, 50 FR 11628, Mar. 22, 1985]

### § 157.138 Crude Oil Washing Operations and Equipment Manual.

(a) Each *Crude Oil Washing Operations and Equipment Manual* must include the following information:

(1) The text of the Annex of Resolution 15 of the MARPOL Protocol.

(2) A line drawing of the tank vessel's COW system showing the locations of pumps, piping, and COW machines.

(3) A description of the COW system.

(4) The procedure for the inspection of the COW system during COW operations.

(5) Design characteristic information of the COW system that includes the following:

(i) Pressure and flow of the crude oil pumped to the COW machines.

(ii) Revolutions, number of cycles, and length of cycles of each COW machine.

(iii) Pressure and flow of the stripping suction device.

(iv) Number and location of COW machines operating simultaneously in each cargo tank.

(6) The design oxygen content of the gas or mixture of gases that is supplied by the inert gas system to each cargo tank.

(7) The results of the inspections recorded when passing the inspections under § 157.140.

(8) Characteristics of the COW system recorded during the COW operations when passing the inspections under § 157.140 that includes the following:

(i) Pressure and flow of the crude oil pumped to the COW machines.

(ii) Revolutions, number of cycles, and length of cycles of each COW machine.

(iii) Pressure and flow of the stripping device.

(iv) Number and location of COW machines operating simultaneously in each cargo tank.

(9) The oxygen content of the gas or mixture of gases that is supplied by the inert gas system to each cargo tank recorded during COW operations when passing the inspections under §157.140.

(10) The volume of water used for water rinsing recorded during COW operations when passing the inspections under §157.140.

(11) The trim conditions of the tank vessel recorded during COW operations when passing the inspections under §157.140.

(12) The procedure for stripping cargo tanks of crude oil.

(13) The procedure for draining and stripping the pumps and piping of the COW system, cargo system, and stripping system after each crude oil cargo discharge.

(14) The procedure for crude oil washing cargo tanks that includes the following:

(i) The tanks to be crude oil washed to meet §157.160.

(ii) The order in which those tanks are washed.

(iii) The single-stage or multi-stage method of washing each tank.

(iv) The number of COW machines that operate simultaneously in each tank.

(v) The duration of the crude oil wash and water rinse.

(vi) The volume of water to be used for water rinse in each tank.

(15) The procedures and equipment needed to prevent leakage of crude oil from the COW system.

(16) The procedures and equipment needed if leakage of crude oil from the COW system occurs.

(17) The procedures for testing and inspecting the COW system for leakage of crude oil before operating the system.

(18) The procedures and equipment needed to prevent leakage of crude oil from the steam heater under §157.122(i) to the engine room.

(19) The number of crew members needed to conduct the following:

(i) The discharge of cargo.

(ii) The crude oil washing of cargo tanks.

(iii) The simultaneous operations in paragraphs (a)(19) (i) and (ii) of this section.

(20) A description of the duties of each crew member under paragraph (a)(19) of this section.

(21) The procedures for ballasting and deballasting cargo tanks.

(22) The step by step procedure for the inspection of the COW system by vessel personnel before COW operations begin that includes the procedure for inspecting and calibrating each instrument. (Operational Checklist)

(23) The intervals for on board inspection and maintenance of the COW equipment. Informational references to technical manuals supplied by the manufacturers may be included in this part of the manual.

(24) A list of crude oils that are not to be used in COW operations.

(25) The procedure to meet §157.155(a)(4).

(b) In addition to meeting paragraph (a) of this section, each *Crude Oil Washing Operations and Equipment Manual* on a tank vessel having a COW system under §157.10a(a)(2) or §157.10c(b)(2) must include the following:

(1) The procedure to meet §157.166.

(2) The procedures to meet §157.155(b).

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

#### INSPECTIONS

##### § 157.140 Tank vessel inspections.

(a) Before issuing a letter under §157.142, the Coast Guard makes an initial inspection of each U.S. tank vessel having a COW system under §157.10(e), §157.10(a)(2), or §157.10c(b)(2) and each foreign tank vessel whose owner or operator submitted the plans under §157.102 to determine whether or not, when entering a port, the cargo tanks that carry crude oil meet the following:

(1) After each tank is crude oil washed but not water rinsed, except the bottom of the tank may be flushed with water and stripped, each tank is essentially free of oil clingage or deposits of oil, or both to a degree acceptable to the Coast Guard inspector.

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(2) After the tanks that are to be used as ballast tanks when leaving the port are crude oil washed and stripped but not water rinsed or bottom flushed, they are filled with water and the total volume of crude oil floating on top of the water in these tanks is 0.085 percent or less of the total volume of these tanks.

(b) Except on a tank vessel under §157.10(e), if the initial inspection under paragraph (a) of this section has been passed and the vessel arrives at the first cargo loading port after completing a ballast voyage, the Coast Guard monitors the discharge of effluent from those tanks that have been crude oil washed, water rinsed, stripped, and filled with ballast water to determine whether or not the oil content of the effluent is 15 ppm or less.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

### § 157.142 Letter of acceptance: Inspections.

If the inspections under §157.140 are passed, the Coast Guard issues to the tank vessel a letter that states that the vessel complies with this subpart.

### § 157.144 Tank vessels of the same class: Inspections.

(a) If more than one tank vessel is constructed from the same plans, the owner or operator may submit a written request to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001, for only one of those tank vessels to be inspected under §157.140.

(b) Only one tank vessel of the class is inspected under §157.140, if the Commandant accepts the request submitted under paragraph (a) of this section.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11630, Mar. 22, 1985; CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

### § 157.146 Similar tank design: Inspections on U.S. tank vessels.

(a) If a U.S. tank vessel has tanks similar in dimensions and internal structure, the owner or operator may submit a written request to the Officer in Charge, Marine Inspection, of the

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zone in which the COW system is inspected, for only one of those tanks to be inspected under §157.140(a)(1).

(b) Only one tank of a group of tanks similar in dimensions and internal structure is inspected under §157.140(a)(1), if the Officer in Charge, Marine Inspection, accepts the request submitted under paragraph (a) of this section.

### § 157.147 Similar tank design: Inspections on foreign tank vessels.

(a) If a foreign tank vessel has tanks similar in dimensions and internal structure, the owner or operator may submit a written request to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001, for only one of those tanks to be inspected under §157.140(a)(1).

(b) Only one tank of a group of tanks similar in dimensions and internal structure is inspected under §157.140(a)(1), if the Commandant accepts the request submitted under paragraph (a) of this section.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11630, Mar. 22, 1985; CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

### § 157.148 COW system: Evidence for inspections.

(a) Before the inspections under §157.140 are conducted by the Coast Guard, the owner or operator of a foreign tank vessel that is to be inspected must submit to the Coast Guard inspector evidence that the COW system has been installed in accordance with the plans accepted under §157.106.

(b) Before the inspections under §157.140 are conducted by the Coast Guard, the owner or operator of a tank vessel that is to be inspected must submit to the Coast Guard inspector evidence that the COW piping system has passed a test of 1½ times the design working pressure.

### § 157.150 Crude Oil Washing Operations and Equipment Manual: Recording information after inspections.

After passing the inspections under §157.140, the owner, operator, and master shall ensure that the following are



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recorded in the *Crude Oil Washing Operations and Equipment Manual* approved under § 157.112:

(a) The results of the inspections under § 157.140.

(b) The following characteristics used to pass the inspections under § 157.140:

(1) Pressure and flow of the crude oil pumped to the COW machines.

(2) Revolutions, number of cycles, and length of cycles of each COW machine.

(3) Pressure and flow of the stripping suction device.

(4) Number and location of COW machines operating simultaneously in each cargo tank.

(5) Volume of water used for water rinsing.

(6) Trim conditions of the tank vessel.

### PERSONNEL

#### § 157.152 Person in charge of COW operations.

The owner, operator, and master of a tank vessel having a COW system under § 157.10(e), § 157.10(a)(2), or § 157.10c(b)(2) shall ensure that the person designated as the person in charge of COW operations—

(a) Knows the contents in the *Crude Oil Washing Operations and Equipment Manual* approved by the Coast Guard under § 157.112 or by the government of the vessel's flag state;

(b) On at least two occasions, has participated in crude oil washing of cargo tanks, one of those occasions occurring on:

(1) The tank vessel on which the person assumes duties as the person in charge of COW operations; or

(2) A tank vessel that is similar in tank design and which has COW equipment similar to that used on the tank vessel on which the person assumes duties as the person in charge of COW operations; and

(c) Has one year or more of tank vessel duty that includes oil cargo discharge operations and:

(1) Crude oil washing of cargo tanks; or

(2) Has completed a training program in crude oil washing operations that is approved by the Coast Guard or the government of the vessel's flag state.

NOTE: Standards of a Coast Guard approved training program are to be developed.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

#### § 157.154 Assistant personnel.

The owner, operator, and master of a tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) shall ensure that each member of the crew that has a designated responsibility during COW operations—

(a) Has six months or more of tank vessel duty that includes oil cargo discharge operations;

(b) Has been instructed in the COW operation of the tank vessel; and

(c) Is familiar with the contents of the *Crude Oil Washing Operations and Equipment Manual* approved by the Coast Guard under § 157.112 or by the government of the vessel's flag state.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

### COW OPERATIONS

#### § 157.155 COW operations: General.

(a) The master of a tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) shall ensure that—

(1) Before crude oil washing a cargo tank, the level in each tank with crude oil that is used as a source for crude oil washing is lowered at least one meter;

(2) A tank used as a slop tank is not used as a source for crude oil washing until:

(i) Its contents are discharged ashore or to another tank; and

(ii) The tank contains only crude oil;

(3) During COW operations:

(i) The valves under § 157.122(i)(1) are shut; or

(ii) The blanks under § 157.122(i)(2) are installed;

(4) The rotation of each COW machine mounted to or close to the bottom of each cargo tank is verified by:

(i) A visual inspection of a means located outside of the cargo tank that indicates movement of the machine during COW operations;

(ii) An audio inspection during COW operations; or

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(iii) An inspection on a ballast voyage, with water as the fluid flowing through the machine;

(5) During the audio inspection under paragraph (a)(4)(ii) of this section, the COW machine being inspected is the only one operating in that tank;

(6) Before the inspection under paragraph (a)(4)(iii) of this section, the tank that has the COW machine being inspected in it, is gas freed;

(7) Each COW machine that is inspected under paragraph (a)(4)(iii) of this section is inspected at least once after every sixth COW operation of that machine, but no less than once every 12 months;

(8) After each stripping operation is completed, each tank:

(i) Is sounded by a means under §157.128(b); and

(ii) Contains no oil except a minimal quantity near the stripping suction;

(9) Before the tank vessel begins each ballast voyage, each cargo tank and each cargo main, stripping, and COW piping is stripped of crude oil and the strippings are conveyed ashore through the piping under §§157.11(d)(3) or 157.11(e)(4);

(10) Before water washing the cargo tanks, the piping of the COW system is drained of crude oil;

(11) When the cargo tanks are not being water washed, the hydrant valves under §157.122(g) are blanked off;

(12) If COW machines that are used as anchors for the piping of the COW system are removed, the means available under §157.122(1) for anchoring the piping are installed;

(13) The fire main is not connected to the COW system; and

(14) On combination carriers, if flexible hoses under §157.122(o) are used, those hoses are protectively stowed when not installed in the COW piping system.

(b) In addition to meeting paragraph (a) of this section, the master of a tank vessel having a COW system under §157.10a(a)(2) or §157.10c(b)(2) shall ensure that—

(1) Before ballasting cargo tanks upon leaving a port, each cargo pump, manifold, and piping that is used for ballasting the cargo tanks is drained of all crude oil; and

(2) Before ballasting or deballasting cargo tanks, except when ballasting cargo tanks to leave a port, the cargo piping that is used for ballasting or deballasting the cargo tanks is water washed.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

**§ 157.156 COW operations: Meeting manual requirements.**

Except as allowed in §157.158, the master of a foreign tank vessel having a COW system under §§157.10(e), 157.10a(a)(2), or 157.10c(b)(2) that has the *Crude Oil Washing Operations and Equipment Manual* approved under §157.112 and is operating in the navigable waters of the United States or transferring cargo at a port or place subject to the jurisdiction of the United States and the master of a U.S. tank vessel having a COW system under §157.10(e), §157.10a(a)(2), or §157.10c(b)(2) shall ensure that during each COW operation—

(a) The procedures listed in the *Crude Oil Washing Operations and Equipment Manual* are followed; and

(b) The characteristics recorded in the *Crude Oil Washing Operations and Equipment Manual* under §157.150(b) are met.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

**§ 157.158 COW operations: Changed characteristics.**

The COW system may be operated with characteristics that do not meet those recorded under §157.150(b) only if:

(a) The tank vessel passes the inspections under §157.140 using the changed characteristics;

(b) The changed characteristics used to pass the inspections under §157.140 are recorded in the *Crude Oil Washing Operations and Equipment Manual* approved under §157.112; and

(c) The Coast Guard issues to the tank vessel an amending letter stating that the tank vessel complies with this subpart with these characteristics.

**§ 157.160 Tanks: Ballasting and crude oil washing.**

(a) The owner, operator, and master of a tank vessel under §157.10(e) shall ensure that:

(1) Ballast water is carried in a cargo tank only as allowed under §157.35;

(2) For sludge control, at least 25 percent of the cargo tanks are crude oil washed before each ballast voyage and that each cargo tank is crude oil washed at least once every fourth time crude oil is discharged from the tank, but no tank need be crude oil washed more than once during each 120 day period;

(3) Ballast water in a cargo tank that is crude oil washed but not water rinsed during or after the most recent discharge of crude oil from that tank is discharged in accordance with §157.37(a); and

(4) Cargo tanks are not crude oil washed during a ballast voyage.

(b) The owner, operator, and master of a tank vessel having a COW system under §157.10a(a)(2) or §157.10c(b)(2) shall ensure that—

(1) Ballast water is carried only in a cargo tank that is crude oil washed during or after the most recent discharge of crude oil from that tank;

(2) Before each ballast voyage a sufficient number of cargo tanks have been crude oil washed during or after the most recent discharge of crude oil from those tanks to allow ballast water to be carried in cargo tanks:

(i) With a total capacity to meet the draft and trim requirements in §157.10a(d); and

(ii) For the vessel's trading pattern and expected weather conditions;

(3) For sludge control, at least 25 percent of the cargo tanks not used for carrying ballast water under paragraph (b)(2)(i) of this section are crude oil washed before each ballast voyage, and that each cargo tank is crude oil washed at least once every fourth time crude oil is discharged from the tank, but no tank need be crude oil washed more than once during each 120 day period;

(4) Cargo tanks are not crude oil washed during a ballast voyage; and

(5) Ballast water in a cargo tank that is crude oil washed but not water rinsed during or after the most recent

discharge of crude oil from that tank is discharged in accordance with §157.37(a).

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

**§ 157.162 Crude oil washing during a voyage.**

The master of a tank vessel having a COW system under §157.10(e), §157.10a(a)(2), or §157.10c(b)(2) shall ensure that each cargo tank that is crude oil washed during a voyage other than a ballast voyage—

(a) Remains empty so that the tank may be inspected upon arrival at the next discharge port; and

(b) If it is to be used as a ballast tank when leaving the discharge port, is ballasted before the vessel departs from that discharge port so that the tank may be inspected under §157.140(a)(2).

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

**§ 157.164 Use of inert gas system.**

(a) The master of a tank vessel having a COW system under §157.10(e), §157.10a(a)(2), or §157.10c(b)(2) shall ensure the following:

(1) Before each cargo tank is crude oil washed, the oxygen content in the tank is measured at each of the following locations in the tank:

(i) One meter from the deck.

(ii) In the center of the ullage space.

(2) Before each cargo tank with partial bulkheads is crude oil washed, each area of that tank formed by each partial bulkhead is measured in accordance with paragraph (a)(1) of this section.

(3) Before each cargo tank is crude oil washed, the oxygen content in that tank is 8 percent or less by volume at the locations under paragraph (a)(1) of this section.

(4) During COW operations, the following are maintained in each cargo tank being crude oil washed:

(i) A gas or a mixture of gases with an oxygen content of 8 percent or less by volume.

(ii) A positive atmospheric pressure.

(5) During COW operations, a crew member monitors the instrumentation

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under 46 CFR 32.53–60(a)(1), except if that instrumentation has an alarm that sounds in the cargo control room when the oxygen content exceeds 8 percent by volume.

(b) Crude oil washing of the cargo tanks must be terminated when paragraph (a)(4) of this section is not met and crude oil washing of that tank may not be resumed until the requirements of paragraph (a)(4) of this section are met.

[CGD 77–058b, 45 FR 43709, June 30, 1980, as amended by CGD 82–28, 50 FR 11628, Mar. 22, 1985]

### § 157.166 Hydrocarbon emissions.

If the tank vessel having a COW system under § 157.10a(a)(2) or § 157.10c(b)(2) transfers cargo at a port in the United States that is in an area designated in 40 CFR Part 81 as an area that does not meet the national primary ambient air quality ozone standard under 40 CFR Part 50, issued under the Clean Air Act, as amended (42 U.S.C. 1857), the master of the vessel shall ensure that when cargo tanks are ballasted in that port the hydrocarbon vapors in each tank are contained by a means under § 157.132.

NOTE: Questions relating to whether or not a particular port is located in an area designated in 40 CFR Part 81 as an area that does not meet the national primary ambient air quality standard under 40 CFR Part 50 should be directed to the Plans Analysis Section of the Environmental Protection Agency at (919) 541–5665.

[CGD 82–28, 50 FR 11628, Mar. 22, 1985]

### § 157.168 Crew member: Main deck watch.

During COW operations, the master shall ensure that at least one member of the crew with a designated responsibility for monitoring COW operations is on the main deck at all times.

### § 157.170 COW equipment: Removal.

(a) Whenever a deck mounted COW machine is removed from the tank, the master shall ensure that:

(1) The supply piping to that machine is blanked off; and

(2) The tank opening is sealed by a secured plate made of steel or an equivalent material accepted by the Commandant.

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(b) If the equipment for the COW system is removed from a cargo tank for the carriage of cargoes other than crude oil and then reinstalled, the master shall ensure that, before COW operations are conducted, the system has no crude oil leakage.

### § 157.172 Limitations on grades of crude oil carried.

If a tank vessel having a COW system meeting § 157.10a(a)(2) or § 157.10c(b)(2) does not have segregated ballast tanks or dedicated clean ballast tanks that meet § 157.10c(c)(2), the owner, operator, and master shall ensure that the vessel carries only the grades of crude oil that can be used for crude oil washing.

[CGD 82–28, 50 FR 11628, Mar. 22, 1985]

## Subpart E—Dedicated Clean Ballast Tanks on Tank Vessels

SOURCE: CGD 77–058b, 45 FR 43714, June 30, 1980, unless otherwise noted.

### GENERAL

### § 157.200 Plans for U.S. tank vessels: Submission.

(a) Before modifications are made to a U.S. vessel to meet § 157.10a(b), § 157.10b(a)(2), § 157.10a(c)(2), or § 157.10c(c)(2), the owner or operator must submit to the Coast Guard plans or documents that include the following:

(1) The dedicated clean ballast tank arrangement.

(2) Documentation, calculations, or revised stability information to show that the vessel, with the addition of the dedicated clean ballast tanks, meets the stability standards for load line assignment in 46 CFR Part 42.

(3) Documentation, calculations, or a loading manual to show that the vessel, with the addition of the dedicated clean ballast tanks, meets the structural standards in 46 CFR Part 32.

(4) A drawing or diagram of the pumping and piping system for the dedicated clean ballast tanks.

(b) Plans under paragraph (a) of this section must be submitted to the Officer in Charge, Marine Inspection, of the zone in which the dedicated clean ballast tank system is installed or to

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the Commanding Officer, U.S. Coast Guard Marine Safety Center, 400 7th Street, SW., Washington, DC 20590-0001.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 77-058b, 45 FR 43714, June 30, 1980, as amended by CGD 79-152, 45 FR 82250, Dec. 15, 1980; CGD 82-28, 50 FR 11628, and 11630, Mar. 22, 1985; CGD 85-048a, 51 FR 15481, Apr. 24, 1986; USCG-1998-3799, 63 FR 35531, June 30, 1998]

### § 157.202 Plans and documents for foreign tank vessels: Submission.

The owner or operator of a foreign tank vessel under § 150.10a(b), § 157.10a(c)(2), or § 157.10b(a)(2) who desires the letter from the Coast Guard under § 157.204 accepting the plans submitted under this paragraph, and the owner or operator of a foreign tank vessel under § 150.10c(c)(2) must submit to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001—

(a) Plans that include:

(1) The dedicated clean ballast tank arrangement; and

(2) A drawing or diagram of the pumping and piping system for the dedicated clean ballast tanks; and

(b) Documentation from the authority that assigned the load line to the tank vessel that states that the location of the dedicated clean ballast tanks is acceptable to that authority.

[CGD 77-058b, 45 FR 43714, June 30, 1980, as amended by CGD 82-28, 50 FR 11629, Mar. 22, 1985; CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

### § 157.204 Letter of acceptance.

The Coast Guard informs the submitter by letter that the plans submitted under § 157.200 or the plans and documents submitted under § 157.202 are accepted, if the plans submitted under § 157.200 or the plans and documents submitted under § 157.202 show that the dedicated clean ballast tank system meets this subpart.

### § 157.206 Dedicated Clean Ballast Tanks Operations Manual for U.S. tank vessels: Submission.

The owner or operator of a U.S. tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or

§ 157.10c(c)(2) must submit two copies of a manual that meets § 157.224 to the Officer in Charge, Marine Inspection, of the zone in which the dedicated clean ballast tank system is installed or to the appropriate Coast Guard field technical office listed in § 157.200(b).

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11629, and 11630, Mar. 22, 1985]

### § 157.208 Dedicated Clean Ballast Tanks Operations Manual for foreign tank vessels: Submission.

If the owner or operator of a foreign tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or § 157.10c(c)(2) desires a Coast Guard approved *Dedicated Clean Ballast Tanks Operations Manual* under § 157.210, the owner or operator must submit two copies of a manual that meets § 157.224 to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11629, and 11630, Mar. 22, 1985, as amended by CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

### § 157.210 Approved Dedicated Clean Ballast Tanks Operations Manual.

If the manuals submitted under § 157.206 or § 157.208 meet § 157.224, the Coast Guard approves the manuals and forwards one of the approved manuals to the submitter.

### § 157.212 Dedicated Clean Ballast Tanks Operations Manual: Not approved.

If the *Dedicated Clean Ballast Tanks Operations Manual* submitted under § 157.206 or § 157.208 is not approved, the Coast Guard forwards a letter to the submitter with the reasons why the manual was not approved.

### § 157.214 Required documents: U.S. tank vessels.

The owner, operator, and master of a U.S. tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or

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§ 157.10c(c)(2) shall ensure that the vessel does not engage in a voyage unless the vessel has on board—

(a) The letter under § 157.204 accepting the dedicated clean ballast tank system plans;

(b) The Coast Guard approved *Dedicated Clean Ballast Tanks Operations Manual* under § 157.210; and

(c) Any amending letters issued under § 157.218 approving alterations.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 77-058b, 45 FR 43714, June 30, 1980, as amended by CGD 82-28, 50 FR 11629, and 11630, Mar. 22, 1985]

**§ 157.216 Required documents: Foreign tank vessels.**

(a) The owner, operator, and master of a foreign tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or § 157.10c(c)(2) shall ensure that the vessel does not enter the navigable waters of the United States or transfer cargo at a port or place subject to the jurisdiction of the United States unless the vessel has on board—

(1) The *Dedicated Clean Ballast Tank Operations Manual* that—

(i) Is approved under § 157.210; or

(ii) Is certified by the government of the vessel's flag state because it meets the manual standards in Resolution 14 of the MARPOL Protocol; and

(2) Either of the following:

(i) A letter from the government of the vessel's flag state that certifies that the vessel complies with Resolution 14 of the MARPOL Protocol.

(ii) The letter of acceptance under § 157.204 and each amending letter issued under § 157.218(c).

(b) On January 1, 1986, or 15 years after the date it was delivered to the original owner or 15 years after the completion of a major conversion, whichever is later, the owner, operator, and master of a foreign tank vessel under § 157.10c(c)(2) shall ensure that the vessel does not enter the navigable waters of the United States or transfer cargo at a port or place subject to the jurisdiction of the United States unless the vessel has on board—

(1) The *Dedicated Clean Ballast Tank Operations Manual* that—

(i) Is approved under § 157.210; or

(ii) Bears a certification by an authorized CS or the government of the vessel's flag state that the manual meets § 157.224; and

(2) Either of the following:

(i) A letter from an authorized CS or the government of the vessel's flag state certifying the vessel complies with §§ 157.220 and 157.222, and any amending letters issued approving alterations.

(ii) The letter of acceptance under § 157.204 and each amending letter issued under § 157.218.

(Reporting and recordkeeping requirements approved by the Office of Management and Budget under control number 2115-0520)

[CGD 82-28, 50 FR 11629, and 11630, Mar. 22, 1985]

**§ 157.218 Dedicated clean ballast tanks: Alterations.**

The dedicated clean ballast tanks or equipment on a tank vessel that has a letter issued under § 157.204 may not be altered so that they no longer meet the plans accepted under that section unless:

(a) The owner or operator of that vessel submits plans that show the alterations to the Coast Guard official to which the plans were submitted under § 157.200 or § 157.202;

(b) The owner or operator of that vessel submits changes to the manual under § 157.224 that show and describe the alterations to the Coast Guard official to which the manuals were submitted under § 157.206 or § 157.208; and

(c) The Coast Guard issues to the tank vessel an amending letter stating that the vessel, as altered, complies with this subpart.

DESIGN AND EQUIPMENT

**§ 157.220 Dedicated clean ballast tanks: Standards.**

(a) Cargo tanks that are designated as dedicated clean ballast tanks must allow the tank vessel to meet the draft and trim requirements under §§ 157.10a(d) and 157.10b(b).

(b) Each tank under paragraph (a) of this section must be:

(1) A wing tank; or

(2) Any other tank that is accepted by the Commandant.

[CGD 77-058b, 45 FR 43714, June 30, 1980, as amended by CGD 79-152, 45 FR 82250, Dec. 15, 1980]

**§ 157.222 Pump and piping arrangements.**

(a) Dedicated clean ballast tanks must be connected to the least practicable:

- (1) Number of pumps; and
- (2) Amount of piping.

(b) Each piping system that is arranged to convey clean ballast and cargo must be designed to be flushed to the slop tank with water.

(c) The piping system of each dedicated clean ballast tank must be arranged so that oily water does not enter any dedicated clean ballast tank when the piping system is flushed.

(d) The piping system of each dedicated clean ballast tank must have at least two valves that isolate that tank from each cargo tank.

(e) The piping system of the dedicated clean ballast tanks must have a sample point that is located in a vertical section of discharge piping.

NOTE: An example of a sample point is shown in 46 CFR Figure 162.050-17(e).

**§ 157.224 Dedicated Clean Ballast Tanks Operations Manual.**

Each *Dedicated Clean Ballast Tanks Operations Manual* must include the following information:

(a) The text of the Annex of Resolution 14 of the MARPOL Protocol.

(b) A description of the dedicated clean ballast tanks system.

(c) A procedure for dedicated clean ballast tanks operations.

NOTE: Appendix D is an example of such a procedure.

DEDICATED CLEAN BALLAST TANKS  
OPERATIONS

**§ 157.225 Dedicated clean ballast tanks operations: General.**

The master of a tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or § 157.10c(c)(2) shall ensure that—

(a) Before clean ballast in any dedicated clean ballast tank is discharged or transferred, the pump and piping system for conveying the clean ballast are flushed with water;

(b) Before any dedicated clean ballast tank is ballasted, the pump and piping system for conveying the ballast are flushed with water;

(c) Before the pump and piping system of the dedicated clean ballast tanks are used for cargo transfer:

(1) If water in the dedicated clean ballast tanks is used for flushing the pump and piping system, the volume of water for flushing is equal to at least 10 times the volume of the piping to be flushed;

(2) The piping system is drained of fluid; and

(3) The valves under § 157.222(d) are closed;

(d) Flushing water is pumped from a sea chest or a dedicated clean ballast tank through the pump and piping system of the dedicated clean ballast tanks and then to a slop tank;

(e) Clean ballast from each dedicated clean ballast tank is discharged in accordance with § 157.43;

(f) When the pump and piping system are being flushed:

(1) The oil content of the flushing water in the piping system is monitored; and

(2) The pump and piping system are flushed until the oil content of the flushing water in the piping stabilizes; and

(g) If any pump or piping system that is flushed to meet paragraph (f) of this section is used to convey cargo during an emergency, that pump or piping system is flushed again to meet paragraph (f) of this section before being used to convey clean ballast.

[CGD 77-058b, 45 FR 43714, June 30, 1980, as amended by CGD 82-28, 50 FR 11629, Mar. 22, 1985]

**§ 157.226 Dedicated Clean Ballast Tanks Operations Manual: Procedures to be followed.**

The master of a foreign tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or § 157.10c(c)(2) that has the *Dedicated Clean Ballast Tanks Operations Manual* approved under § 157.210 and is operating in the navigable waters of the United States or transferring cargo at a port or place subject to the jurisdiction of the United States and the master of a U.S. tank vessel meeting § 157.10a(b), § 157.10a(c)(2),

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§ 157.10b(a), or § 157.10c(c)(1) shall ensure that the procedure listed in the *Dedicated Clean Ballast Tanks Operations Manual* are followed.

[CGD 82-28, 50 FR 11629, Mar. 22, 1985]

### § 157.228 Isolating Valves: Closed during a voyage.

(a) The master of each U.S. tank vessel under § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or § 157.10c(c)(2) shall ensure that the valves under § 157.222(d) remain closed during each voyage.

(b) The master of each foreign tank vessel meeting § 157.10a(b), § 157.10a(c)(2), § 157.10b(a)(2), or § 157.10c(c)(2) shall ensure that the valves under § 157.222(d) remain closed when the vessel is on a voyage in the navigable waters of the United States.

[CGD 82-28, 50 FR 11629, Mar. 22, 1985]

## Subpart F—Exemption From § 157.10a or § 157.10c

SOURCE: CGD 79-126, 46 FR 3513, Jan. 15, 1981, unless otherwise noted.

### § 157.300 Qualifications for exemptions under this part.

(a) Each vessel under § 157.10a or § 157.10c of this part may qualify for an exemption from the requirements of § 157.10a or § 157.10c of this part if—

(1) The vessel loads and discharges cargo only at ports or places within the United States, its territories, or its possessions; and

(2) The application for exemption meets § 157.302.

(b) Except where the owner can show good cause, a vessel is not granted an exemption under this subpart if a previous exemption for the vessel has been revoked by the Coast Guard under § 157.308(a)(1) or § 157.308 (a)(2).

[CGD 79-126, 46 FR 3513, Jan. 15, 1981, as amended by CGD 82-28, 50 FR 11630, Mar. 22, 1985]

### § 157.302 Applying for an exemption or requesting modification of an exemption.

(a) Each application for an exemption or modification must be in writing and submitted to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001.

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(b) Each application for exemption must include the following: (1) The name and official number of the vessel for which the exemption is requested.

(2) A list of each port or place where the vessel would load cargo.

(3) The name, address, and telephone number for each shore-based reception facility at each port listed under paragraph (b)(2) of this section where the vessel would discharge its ballast water and cargo residues, including:

(i) The name or title of the person at each facility who should be contacted for information concerning the operation of the reception facility; and

(ii) A statement from the facility owner disclosing whether or not, based on current operating conditions, the facility has the capability of processing the anticipated volume and type of discharges from the vessel without adversely affecting the service of the facility to current users.

(4) The number of the permit under the National Pollutant Discharge Elimination System (NPDES permit) issued to each listed shore-based reception facility.

(5) A list of each type of oil cargo that the vessel would load.

(6) A description of the method by which the vessel would discharge ballast water and cargo residues to each listed shore based reception facility.

(c) Each request for modification to an exemption must include the following:

(1) The name and official number of the vessel for which the modification to the exemption is requested.

(2) The reason for requesting modification of the exemption.

(3) Any additional information which is pertinent to the modification.

[CGD 79-126, 46 FR 3513, Jan. 15, 1981, as amended by CGD 82-28, 50 FR 11630, Mar. 22, 1985; CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996]

### § 157.304 Shore-based reception facility: standards.

No shore-based reception facility may be listed to meet § 157.302(b)(3) unless that reception facility has:

(a) A valid NPDES permit which allows it to process the ballast water and cargo residues of the vessel for which the exemption is being requested; and



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(b) The capacity to receive and store a volume of dirty ballast water equivalent to 30 percent of the deadweight, less the segregated ballast volume, of the vessel for which the exemption is being requested.

### § 157.306 Granting, denying, or modifying an exemption.

(a) The Assistant Commandant for Marine Safety and Environmental Protection issues a written decision concerning the grant or denial of each exemption or modification requested under § 157.302.

(b) If the exemption or request for modification is denied, the decision under paragraph (a) of this section includes the reasons for the denial.

(c) Any person directly affected by, and not satisfied with, a decision made under paragraph (a) of this section may appeal that decision, in writing, to the Commandant (G-MOC), U.S. Coast Guard, Washington, DC 20593-0001. The appeal may contain any supporting documentation or evidence that the appellant wishes to have considered.

(d) The Commandant, U.S. Coast Guard issues a ruling after reviewing the appeal submitted under paragraph (c) of this section. This ruling is final agency action.

[CGD 79-126.46 FR 3513, Jan. 15, 1981, as amended by CGD 88-052, 53 FR 25122, July 1, 1988; CGD 96-026, 61 FR 33668, June 28, 1996; CGD 97-023, 62 FR 33364, June 19, 1997]

### § 157.308 Revocation of exemption: procedure and appeals.

(a) The Officer in Charge, Marine Inspection may consider the revocation of the exemption granted under this subpart when:

- (1) Requested by the vessel's owner;
- (2) There is evidence that the vessel's owner, operator, or master has failed to comply with the requirements of this subpart; or
- (3) There have been changes to the NPDES permit of a reception facility listed to meet § 157.304(b)(3) that would adversely affect the ability of that facility to process the vessel's discharges.

(b) The Officer in Charge, Marine Inspection, of the zone in which an occurrence under paragraph (a)(2) or (a)(3) of this section takes place notifies the

owner, operator, and master of the exempted vessel of the specific reasons for considering the revocation of the exemption.

(c) Evidence or arguments for the retention of the exemption that are submitted to the Officer in Charge, Marine Inspection within thirty days of receipt of the notice under paragraph (b) of this section will be considered before a ruling is made.

(d) If the owner is not satisfied with the ruling made under this section by the Officer in Charge, Marine Inspection, that ruling may be appealed under the procedure in § 157.06 of this part.

### § 157.310 Exempted vessels: operations.

The owner, operator, and master of each vessel that has been granted an exemption under this subpart must ensure that:

(a) The vessel trades only between ports or places within the United States, its territories or possessions;

(b) The vessel loads cargo only at ports or places listed in the exemption;

(c) Except as allowed under § 157.41 (a) and (b) of this part, any ballast water, except segregated ballast discharged in accordance with § 157.43(b) of this part, and any tank washing or cargo residues are:

- (1) Retained on board; or
- (2) Transferred to a shore-based reception facility that is listed in the application for exemption, or in the case of an emergency or a shipyard entry, an alternative acceptable to the cognizant Officer in Charge, Marine Inspection;

(d) The vessel loads only those cargoes listed in the exemption; and

(e) The letter under § 157.306 that grants the exemption is on board the vessel; or

(f) The certificate of inspection bearing the following endorsement is on board the vessel:

Exempted under 33 CFR 157.306 from the requirements of (33 CFR 157.10a or 157.10c, whichever is appropriate, will be inserted). This vessel may not discharge cargo in any foreign port, nor may it load cargo in a port other than the following: (a list of ports contained in the application that is accepted by the Coast

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*Guard for the exempted vessel will be inserted here).*

[CGD 79-126, 46 FR 3513, Jan. 15, 1981, as amended by CGD 82-28, 50 FR 11630, Mar. 22, 1985]

### **Subpart G—Interim Measures for Certain Tank Vessels Without Double Hulls Carrying Petroleum Oils**

SOURCE: CGD 91-045, 59 FR 40188, Aug. 5, 1994, unless otherwise noted.

#### **§ 157.400 Purpose and applicability.**

(a) The purpose of this subpart is to establish mandatory safety and operational requirements to reduce environmental damage resulting from petroleum oil spills.

(b) This subpart applies to each tank vessel specified in §157.01 of this part that—

- (1) Is 5,000 gross tons or more;
- (2) Carries petroleum oil in bulk as cargo or cargo residue; and
- (3) Is not equipped with a double hull meeting §157.10d of this part, or an equivalent to the requirements of §157.10d, but required to be equipped with a double hull at a date set forth in 46 U.S.C. 3703a (b)(3) and (c)(3).

[CGD 91-045, 61 FR 39788, July 30, 1996]

#### **§ 157.410 Emergency lightering requirements for oil tankers.**

Each oil tanker, to which this subpart applies, shall carry the equipment listed in paragraphs (a), (b), and (c) of this section. This equipment shall be located on the main deck, in the cargo control room, in the pump room, or in the forecandle locker. This equipment must be protected from the weather and must be stored in one separate and marked location which is as convenient to the cargo manifold, as is practicable.

(a) Reducers, adapters, bolts, washers, nuts, and gaskets to allow at least two simultaneous transfer connections to be made from the vessel's cargo manifold to 15-centimeter (6-inch), 20-centimeter (8-inch), and 25-centimeter (10-inch) cargo hoses. All reducers must be permanently marked with sizes.

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(b) One extra set of adapters, bolts, washers, nuts, and gaskets per reducer set must be carried as spares.

(c) Reducers, bolts, and gaskets must meet the requirements of 46 CFR 56.25. Cast iron and malleable iron must not be used.

[CGD 91-045, 59 FR 40188, Aug. 5, 1994, as amended by CGD 91-045, 61 FR 39789, July 30, 1996; USCG-1998-3799, 63 FR 35531, June 30, 1998]

#### **§ 157.415 Bridge resource management policy and procedures.**

(a) Not later than February 1, 1997, a tankship owner or operator shall provide written policy and procedures to masters and officers in charge of the navigational watch concerning the need for continuously reassessing how bridge-watch resources are being allocated and used, based on bridge resource management principles. This written policy and procedures must include vessel and crew specific examples that address the following:

(1) The number of qualified individuals that should be on watch to ensure that all duties can be performed effectively.

(2) The appropriate qualifications of all members of the navigational watch, the importance of confirming that all members of the watch are fit for duty, and the need to ensure that all members of the navigational watch are not impaired by fatigue.

(3) The need to take into account any known limitation in qualifications or fitness of individuals when making navigational and operational decisions.

(4) The need to be clear and unambiguous in assigning duties and the need to establish that the individual understands his or her responsibilities.

(5) The need to perform tasks in a clear order of priority and to adjust the priority of tasks as circumstances may require.

(6) The importance of assigning and reassigning members of the watch to locations where they can perform their duties most effectively.

(7) Conditions that warrant task reassignment among members of the watch.

(8) The instruments and equipment necessary for the effective performance of each task and appropriate actions if

the instruments and equipment are not available or not functioning properly.

(9) The need for, and examples of, clear, immediate, reliable, and relevant communication among members of the navigational watch.

(10) The action to be taken to suppress, remove, and avoid nonessential activity and distractions on the bridge.

(11) The importance of collecting, processing, and interpreting all essential information and making it conveniently available to other members of the navigational watch and the pilot, as necessary to perform their duties.

(12) The need to ensure that non-essential materials are not placed on the bridge.

(13) The need to ensure that members of the navigational watch are prepared to respond at all times efficiently and effectively to changes in circumstances.

(b) Beginning not later than February 1, 1997, a tank barge owner or operator shall not permit the barge to be towed unless those individuals assigned to duties that are similar to the duties of the officer in charge of a navigational watch on the primary towing vessel have been provided written bridge resource management policy and procedures as specified in paragraph (a) of this section.

[CGD 91-045, 61 FR 39789, July 30, 1996]

**§ 157.420 Vessel specific watch policy and procedures.**

(a) Not later than February 1, 1997, the owner or operator of a tankship shall provide written policy and procedures to masters concerning the need for each individual who is newly employed on board the vessel to have a reasonable opportunity to become familiar with the shipboard equipment, operating procedures, and other arrangements needed for the proper performance of their duties, before being assigned to such duties. This written policy and procedures shall be followed by the master and shall include the following:

(1) Allocation of a reasonable and appropriate time period for each newly employed individual to allow him or her the opportunity to become acquainted with the following:

(i) The specific equipment the individual will be using or operating; and

(ii) The vessel specific watchkeeping, safety, environmental protection, and emergency procedures and arrangements the individual needs to know to perform the assigned duties properly.

(2) Designation of a knowledgeable crew member who will be responsible for ensuring that an opportunity is provided to each newly employed individual to receive essential information in a language the individual understands.

(b) Beginning not later than February 1, 1997, a tank barge owner or operator shall not permit the barge to be towed unless those individuals assigned to duties as master or operator on the primary towing vessel have been provided written policy and procedures as specified in paragraph (a) of this section.

[CGD 91-045, 61 FR 39789, July 30, 1996]

**§ 157.430 Enhanced survey requirements.**

Beginning at each tank vessel's next regularly scheduled drydock examination and continuing as required under 46 CFR part 31, or, for each foreign flagged tank vessel, beginning at the next drydock and continuing as required under the foreign vessel's flag administration, a tank vessel owner or operator shall—

(a) Implement an enhanced survey program that complies with the standards of IMO Resolution A.744(18), Annex B sections 1.1.3-1.1.4, 1.2-1.3, 2.1, 2.3-2.6, 3-8, and Annexes 1-10 with appendices;

(b) Implement a vessel specific survey program that provides a level of protection equivalent to the requirements in paragraph (a)(1) of this section and is approved by the Commandant (G-MOC). A written request for program equivalency under this paragraph must be submitted to the Commandant (G-MOC); or

(c) For a tankship of less than 20,000 deadweight tons (dwt) carrying crude oil, a tankship of less than 30,000 dwt carrying product, or a tank barge, implement an enhanced survey program that—

(1) Includes oversight of the program by the Coast Guard, the vessel's flag

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administration, an authorized classification society as described in §157.04 of this part, or a licensed professional engineer;

(2) Has the frequency of survey which is no less than the inspections required by 46 CFR subpart 31.10;

(3) Has survey scope and record-keeping requirements that are comparable to the requirements of paragraph (a)(1) of this section; and

(4) Includes keeping a copy of the most recent survey on board the vessel or, upon request by the Coast Guard, making the surveys available within 24 hours for examination.

[CGD 91-045, 61 FR 39789, July 30, 1996]

**§ 157.435 Vital systems surveys.**

(a) A tank vessel owner or operator shall ensure that surveys of the following systems are conducted:

(1) *Cargo systems.* The survey must include the examination and testing of the items listed in chapters 6, 7, and 10 of the International Safety Guide for Oil Tankers and Terminals, if applicable, prior to cargo transfer operations.

(2) *Mooring systems.* The survey must include a visual examination of the emergency towline, the anchor releasing mechanism, and mooring lines prior to entering the port or place of destination, if weather permits, or prior to getting underway.

(b) Surveys must be conducted by company management personnel, company designated individuals, or vessel officers knowledgeable about the equipment operating parameters and having the authority, capability, and responsibility to initiate corrective action when the equipment is not functioning properly.

(c) The results of the survey required in paragraph (a) of this section, including the material condition of each system, must be recorded in the tank vessel's deck log or other onboard documentation.

[CGD 91-045, 61 FR 39789, July 30, 1996; 61 FR 41685, Aug. 9, 1996]

**§ 157.440 Autopilot alarm or indicator.**

(a) A tankship owner or operator shall ensure that each installed autopilot unit without automatic manual override has an audible and visual

alarm, which is distinct from other required bridge alarms, that will activate if the helm is manually moved while the autopilot is engaged.

(b) A tank barge owner or operator shall ensure that each autopilot unit without automatic manual override installed on the primary towing vessel has a means to clearly indicate the autopilot status and warns personnel of the requirement to disengage the autopilot if positive rudder control is needed.

[CGD 91-045, 61 FR 39790, July 30, 1996]

**§ 157.445 Maneuvering performance capability.**

(a) A tankship owner or operator shall ensure that maneuvering tests in accordance with IMO Resolution A.751(18), sections 1.2, 2.3-2.4, 3-4.2, and 5 (with Explanatory Notes in MSC/Circ.644) have been conducted by July 29, 1997. Completion of maneuvering performance tests must be shown by—

(1) For a foreign flag tankship, a letter from the flag administration or an authorized classification society, as described in §157.04 of this part, stating the requirements in paragraph (a) of this section have been met; or

(2) For a U.S. flag tankship, results from the vessel owner confirming the completion of the tests or a letter from an authorized classification society, as described in §157.04 of this part, stating the requirements in paragraph (a) of this section have been met.

(b) If a tankship undergoes a major conversion or alteration affecting the control systems, control surfaces, propulsion system, or other areas which may be expected to alter maneuvering performance, the tankship owner or operator shall ensure that new maneuvering tests are conducted as required by paragraph (a) of this section.

(c) If a tankship is one of a class of vessels with identical propulsion, steering, hydrodynamic, and other relevant design characteristics, maneuvering performance test results for any tankship in the class may be used to satisfy the requirements of paragraph (a) of this section.

(d) The tankship owner or operator shall ensure that the performance test results, recorded in the format of Appendix 6 of the Explanatory Notes in

MSC/Circ.644, are prominently displayed in the wheelhouse.

(e) Prior to entering the port or place of destination and prior to getting underway, the tankship master shall discuss the results of the performance tests with the pilot while reviewing the anticipated transit and the possible impact of the tankship's maneuvering capability on the transit.

[CGD 91-045, 61 FR 39790, July 30, 1996; 61 FR 41685, Aug. 9, 1996]

**§ 157.450 Maneuvering and vessel status information.**

A tankship owner, master, or operator shall comply with IMO Resolution A.601(15), Annex sections 1.1, 2.3, 3.1, and 3.2, with appendices.

[CGD 91-045, 61 FR 39790, July 30, 1996]

**§ 157.455 Minimum under-keel clearance.**

(a) The owner or operator of a tankship, that is not fitted with a double bottom that covers the entire cargo tank length, shall provide the tankship master with written under-keel clearance guidance that includes—

(1) Factors to consider when calculating the ship's deepest navigational draft;

(2) Factors to consider when calculating the anticipated controlling depth;

(3) Consideration of weather or environmental conditions; and

(4) Conditions which mandate when the tankship owner or operator shall be contacted prior to port entry or getting underway; if no such conditions exist, the guidance must contain a statement to that effect.

(b) Prior to entering the port or place of destination and prior to getting underway, the master of a tankship that is not fitted with the double bottom that covers the entire cargo tank length shall plan the ship's passage using guidance issued under paragraph (a) of this section and estimate the anticipated under-keel clearance. The tankship master and the pilot shall discuss the ship's planned transit including the anticipated under-keel clearance. An entry must be made in the tankship's official log or in other on-

board documentation reflecting discussion of the ship's anticipated passage.

(c) The owner or operator of a tank barge, that is not fitted with a double bottom that covers the entire cargo tank length, shall not permit the barge to be towed unless the primary towing vessel master or operator has been provided with written under-keel clearance guidance that includes—

(1) Factors to consider when calculating the tank barge's deepest navigational draft;

(2) Factors to consider when calculating the anticipated controlling depth;

(3) Consideration of weather or environmental conditions; and

(4) Conditions which mandate when the tank barge owner or operator shall be contacted prior to port entry or getting underway; if no such conditions exist, the guidance must contain a statement to that effect.

[CGD 91-045, 62 FR 49608, Sept. 23, 1997]

**§ 157.460 Additional operational requirements for tank barges.**

(a) *Emergency steering capability.* The owner or operator of each tank barge shall not permit the barge to be towed unless, by November 27, 1997, the primary towing vessel has—

(1) A steering gear system with a main power unit, an alternative power unit, and two remote steering gear control systems, except that separate steering wheels or steering levers are not required. The steering gear control systems must be arranged so that if the system in operation fails, the other system can be brought into immediate operation from a position on the navigating bridge; or

(2) Twin screw propulsion with separate control systems for each propeller.

(b) *Fendering system.* An owner or operator of a tank barge shall not permit the barge to be towed unless the primary towing vessel and any fleeting or assist towing vessels have a fendering system that is of substantial size and composition to prevent metal to metal contact between the towing vessel and the barge during maneuvering operations.

[CGD 91-045, 61 FR 39790, July 30, 1996; 61 FR 41685, Aug. 9, 1996]

**Subpart H—Interim Measures for Certain Tank Vessels Without Double Hulls Carrying Animal Fat or Vegetable Oil**

SOURCE: CGD 91-045, 61 FR 39791, July 30, 1996, unless otherwise noted.

**§ 157.500 Purpose and applicability.**

(a) The purpose of this subpart is to establish mandatory safety and operational requirements to reduce environmental damage resulting from the discharge of animal fat or vegetable oil.

(b) This subpart applies to each tank vessel specified in §157.01 of this part that—

- (1) Is 5,000 gross tons or more;
- (2) Carries animal fat or vegetable oil in bulk as cargo or cargo residue; and
- (3) Is not equipped with a double hull meeting §157.10d of this part, or an equivalent to the requirements of §157.10d, but required to be equipped with a double hull at a date set forth in 46 U.S.C. 3703a (b)(3) and (c)(3).

**§ 157.510 Operational measures.**

An owner or operator of a tank vessel that carries animal fat or vegetable oil in bulk as cargo or cargo residue shall comply with the requirements in all sections of subpart G of this part.

**Subpart I—Interim Measures for Certain Tank Vessels Without Double Hulls Carrying Other Non-Petroleum Oil**

SOURCE: CGD 91-045, 61 FR 39791, July 30, 1996, unless otherwise noted.

**§ 157.600 Purpose and applicability.**

(a) The purpose of this subpart is to establish mandatory safety and operational requirements to reduce environmental damage resulting from the discharge of other non-petroleum oil.

(b) This subpart applies to each tank vessel specified in §157.01 of this part that—

- (1) Is 5,000 gross tons or more;
- (2) Carries other non-petroleum oil in bulk as cargo or cargo residue; and
- (3) Is not equipped with a double hull meeting §157.10d of this part, or an equivalent to the requirements of §157.10d, but required to be equipped with a double hull at a date set forth in 46 U.S.C. 3703a (b)(3) and (c)(3).

**§ 157.610 Operational measures.**

An owner or operator of a tank vessel that carries other non-petroleum oil in bulk as cargo or cargo residue shall comply with the requirements in all sections of subpart G of this part.

**APPENDIX A TO PART 157—DAMAGE ASSUMPTIONS, HYPOTHETICAL OUTFLOWS, AND CARGO TANK SIZE AND ARRANGEMENTS**

1. *Source.* The procedures for the damage assumption calculations contained in this Appendix conform to Regulations 22, 23, and 24 of Annex I of the International Convention for the Prevention of the Pollution from Ships, 1973, done at London, November 2, 1973.

2. *Assumptions.* For the purpose of calculating hypothetical outflow from tank vessels, three dimensions of the extent of damage of a parallelepiped on the side and bottom of the vessel are assumed.

(a) For side damage, the conditions are as follows:

Damage	Conditions
(1) Longitudinal extent ( $l_c$ ) .....	$\frac{1}{3} L^{2/3}$ or 14.5 m, whichever is less.
(2) Transverse extent ( $t_c$ ) (inboard from the vessel's side at right angles to the centerline at the level corresponding to the assigned summer freeboard).	$B$ —or 11.5 m, whichever is 5 less.
(3) Vertical extent ( $v_c$ ) .....	From the base line upwards without limit.

(b) For bottom damage, two conditions to be applied individually to the stated portions of the vessel, as follows:

Damage	Conditions	
	For 0.3L from the forward perpendicular of ship	Any other part of ship
(1) Longitudinal extent ( $l_s$ ) .....	$L/10$ .....	$L/10$ or 5 meters, whichever is less.
(2) Transverse extent ( $t_s$ ) .....	$B/6$ or 10 meters, whichever is less but not less than 5 meters.	5 meters.
(3) Vertical extent from the base line ( $v_s$ ) .....	$B/15$ or 6 meters, whichever is less .....	$B/15$ or 6 meters, whichever is less.

3. *Hypothetical Outflow of Oil.* (a) The hypothetical outflow of oil in the case of side damage ( $O_c$ ) and bottom damage ( $O_s$ ) is calculated by the following formula with respect to compartments breached by damage to all conceivable locations along the length of the vessel to the extent as defined in section 2 of this Appendix.

(1) For side damages: Formula

$$O_c = \Sigma W_i + \Sigma K_i C_i$$

(2) For bottom damage: Formula II

$$O_s = \frac{1}{3}(\Sigma Z_i W_i + \Sigma Z_i C_i)$$

Where:

$W_i$ =Volume of a wing tank assumed to be breached by the damage as specified in section 2 of this Appendix;  $W_i$  for a segregated ballast tank may be taken equal to zero;

$C_i$ =Volume of a center tank assumed to be breached by the damage as specified in section 2 of this Appendix;  $C_i$  for a segregated ballast tank may be taken equal to zero;

$$K_i = 1 - \frac{b_i}{t_c}$$

when  $b_i$  is equal to or greater than  $t_c$ ,  $K_i$  is equal to zero;

$$Z_i = 1 - \frac{h_i}{v_s}$$

when  $h_i$  is equal to or greater than  $v_s$ ,  $Z_i$  is equal to zero;

$b_i$ =Minimum width of wing tank under consideration measured inboard from the vessel's side at right angles to the centerline at the level corresponding to the assigned summer freeboard; and

$h_i$ =Minimum depth of the double bottom under consideration; where no double bottom is fitted,  $h_i$  is equal to zero.

(b) If a void space or segregated ballast tank of a length less than  $l_c$  is located between wing oil tanks,  $O_c$  in formula I of this section may be calculated on the basis of volume  $W_i$  being the actual volume of one such tank (where they are of equal capacity) or the smaller of the two tanks (if they differ in capacity), adjacent to such space, multiplied by  $S_i$  as defined below and taking for all other wing tanks involved in such a collision the value of the actual full volume.

$$S_i = 1 - \frac{l_i}{l_c}$$

Where  $l_i$ =length of void space or segregated ballast tank under consideration.

(c) Credit is only given in respect to double bottom tanks which are either empty or carrying clean water when cargo is carried in the tanks above.

(1) If the double bottom does not extend for the full length and width of the tank involved, the double bottom is considered non-

existent and the volume of the tanks above the area of the bottom damage must be included in formula II of this section even if the tank is not considered breached because of the installation of such a partial double bottom.

(2) Suction wells may be neglected in the determination of the value  $h_i$  if such wells are not excessive in area and extend below the tank for a minimum distance and in no case more than half the height of the double bottom. If the depth of such a well exceeds half the height of the double bottom,  $h_i$  is taken equal to the double bottom height minus the well height.

(d) In the case where bottom damage simultaneously involves four center tanks, the value of  $O_s$  may be calculated according to formula III as follows:

$$O_s = \frac{1}{4}(\Sigma Z_i W_i + \Sigma Z_i C_i)$$

(e) Credit for reduced oil outflow from bottom damage may be applied to formula III for an installed emergency high suction cargo transfer system that:

(1) transfers within two hours oil equal to one half of the volume of the largest tank involved;

(2) has sufficient ballast or cargo tankage available to receive the transferred oil; and

(3) has the high suction piping installed at a height not less than the vertical extent of bottom damage ( $v_s$ ).

4. *Allowable volumes of cargo tanks.*

(a) The allowable volume of a wing cargo tank ( $VOL_w$ ) is equal to seventy-five percent of  $O_A$ . In a segregated ballast tank vessel  $VOL_w$  may equal  $O_A$  for a wing cargo oil tank located between two segregated ballast tanks each of length greater than  $l_c$  and width greater than  $t_c$ .

(b) The allowable volume of a center cargo tank ( $VOL_c$ ) is 50,000 cubic meters.

5. *Allowable length of cargo tanks.*

The length of each cargo tank ( $l$ ) must not exceed 10 meters or the distance calculated from (a), (b), or (c), as appropriate, whichever is greater:

(a) Where no longitudinal bulkhead is provided inside the cargo tanks:  $l = [0.5(b_i/B) + 0.1] L$ , but not to exceed 0.2L.

(b) Where a centerline longitudinal bulkhead is provided inside the cargo tanks:  $l = [0.25(b_i/B) + 0.15] L$ , but not to exceed 0.2L.

(c) Where two or more longitudinal bulkheads are provided inside the cargo tanks:

(1) For wing cargo tanks:  $l = 0.2L$ .

(2) For center cargo tanks:

(i) If  $(b_i/B)$  is equal to or greater than 0.2,  $l = 0.2L$ .

(ii) If  $(b_i/B)$  is less than 0.2:

(A) Where no centerline longitudinal bulkhead is provided,  $l = [0.5(b_i/B) + 0.1] L$ .

(B) Where a centerline longitudinal bulkhead is provided,  $l = [0.25(b_i/B) + 0.15] L$ .

(d) “bi” is the minimum distance from the ship’s side to the outer longitudinal bulkhead of the tank in question, measured inboard at right angles to the centerline at the level corresponding to the assigned summer freeboard.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 74-32, 40 FR 49328, Oct. 22, 1975; CGD 90-051, 57 FR 36245, Aug. 12, 1992]

APPENDIX B TO PART 157—SUBDIVISION AND STABILITY ASSUMPTIONS

1. *Source.* The procedures for the loading assumption calculations contained in this Appendix conform to Regulation 25 of Annex I of the International Convention for the Prevention of the Pollution from Ships, 1973, done at London, November 2, 1973.

2. *Loading Assumptions.* For the purpose of calculating subdivision and damage stability for a tank vessel, the operating drafts must reflect actual partial or full load conditions consistent with trim and strength of the vessel. Ballast conditions need not be considered if the tank vessel is not carrying oil in cargo tanks excluding oily residues. Loading condition must reflect the specific gravities of the cargo.

3. *Damage Assumptions.*

(a) Damage is applied to all conceivable locations along the length of the vessel as follows:

(1) For a vessel of more than 225 meters in length, anywhere in the vessel’s length.

(2) For a vessel of more than 150 meters, but not exceeding 225 meters in length, anywhere in the vessel’s length except where the after or forward bulkhead bounding a machinery space located aft is involved in the damage assumption. The machinery space is calculated as a single floodable compartment.

(3) For a vessel 150 meters or less in length, anywhere in the vessel’s length between adjacent transverse bulkheads except the machinery space.

(b) The extent and the character of the assumed side or bottom damage, as defined in section 2 of Appendix A of this part, must be applied except longitudinal bottom damage within 0.3L from the forward perpendicular must be assumed to be the same as that for side damage. If any damage of lesser extent results in a more severe condition, such damage must be assumed.

(c) If damage involves transverse bulkheads as specified in paragraphs (a)(1) and (2) of this section, transverse watertight bulkheads must be spaced at least at a distance equal to the longitudinal extent of the assumed damage specified in paragraph (b) of this section in order to be considered effective. Where transverse bulkheads are spaced at a lesser distance, one or more of these bulkheads within such extent of damage

must be assumed as nonexistent for the purpose of determining flooded compartments.

(d) If the damages between adjacent transverse watertight bulkheads is within the definition contained in paragraph (a)(3) of this section, no main transverse bulkhead or a transverse bulkhead bounding side tanks or double bottom tanks is to be assumed damaged, unless:

(1) the spacing of the adjacent bulkheads is less than the longitudinal extent of assumed damage defined in paragraph (b) of this section; or

(2) there is a step or a recess in a transverse bulkhead of more than 3.05 meters in length, located within the extent of penetrations of assumed damage. The step formed by the after peak bulkhead and after peak tank top is not regarded as a step for these calculations.

(e) If pipes, ducts, or tunnels are situated within the assumed extent of damage, there must be arrangements so that progressive flooding may not thereby extend to compartments other than those assumed to be floodable for each case of damage.

4. *Characteristic and Condition Assumption for Calculations.*

(a) Account must be taken of any empty or partially filled tanks, the specific gravity of cargoes carried, and any outflow of liquids from damaged compartments.

(b) The permeabilities are assumed as follows:

Intended space use	Permeability
Stores .....	0.60
Accommodation .....	0.95
Machinery .....	0.85
Voids .....	0.95
Consumable liquids .....	<sup>1</sup> 0 or 0.95
Other liquids .....	<sup>2</sup> 10 or 0.95

<sup>1</sup> Whichever results in the more severe requirements.

<sup>2</sup> The permeability of partially filled compartments must be consistent with actual density and the amount of liquid carried.

(c) The buoyancy of any superstructure directly above the side damage is to be disregarded. The unflooded parts of superstructures beyond the extent of damage may be taken into consideration if they are separated from the damaged space by watertight bulkheads and no progressive flooding of these intact spaces takes place. Class I doors are allowed in watertight bulkheads in the superstructure.

(d) The free surface effect is to be calculated:

(1) at an angle of heel of 5 degrees for each individual compartment; or

(2) by assessing the shift of liquids by moment of transference calculations.

(e) In calculating the effect of free surfaces of consumable liquids, it is to be assumed that, for each type of liquid, at least one transverse pair or a single centerline tank has a free surface and the tank or combination of tanks to be taken into account is to



be those where the effect of free surface is the greatest.

APPENDIX C TO PART 157—PROCEDURE FOR DETERMINING DISTRIBUTION OF SEGREGATED BALLAST TANKS TO PROVIDE PROTECTION AGAINST OIL OUTFLOW IN THE EVENT OF GROUNDING, RAMMING, OR COLLISION

1. *Source.* The procedure for determining the distribution of segregated ballast tanks contained in this appendix conforms to Regulation 13E of the MARPOL Protocol.

2. *Procedure.* Protective location of segregated ballast tanks, voids, and other spaces that do not carry cargo which are within the cargo tank length is determined from the following:

$$\Sigma PA_c + \Sigma PA_s = J[L_t(B + 2D)]$$

Where:

PA<sub>c</sub>=the side shell area in square meters based on projected molded dimensions for each segregated ballast tank, void, or other space that does not carry cargo and which complies with paragraph 2(b) of this appendix;

PA<sub>s</sub>=the bottom shell area in square meters based on projected molded dimensions for each segregated ballast tank, void, or other space that does not carry cargo and which complies with paragraph 2(b) of this appendix;

L<sub>t</sub>=the length in meters between the forward and after extremities of the cargo tanks;

B=the maximum breadth of the ship in meters measured amidship to the molded line of the frame; and

D=the molded depth in meters measured vertically from the top of the keel plate to the top of the freeboard deck beam at the side amidships. In tank vessels having rounded gunwales, the molded depth is measured from the top of the keel plate to the point of intersection of the molded lines of the deck and side shell plating, the lines being extended as though the gunwale were of angular design.

(a) *Method of determining a value for J.*

(1) For tank vessels for 20,000 DWT, J=0.45.

(2) For tank vessels of 200,000 DWT or more:

(i) J=0.30; or

(ii) J=the greater of 0.20, or

$$0.30 - \left[ a - \frac{(O_c + O_s)}{40 A} \right],$$

where:

a=0.25 for tank vessels of 200,000 DWT.

a=0.40 for tank vessels of 300,000 DWT.

a=0.50 for tank vessels of 420,000 DWT.

For values of DWT between 200,000 and 300,000 DWT, 300,000 and 420,000 DWT, and

greater than 420,000 DWT, the value of "a" is determined by linear interpolation.

O<sub>c</sub> = as calculated in Appendix A of this part.

O<sub>s</sub> = as calculated in Appendix A of this part.

O<sub>A</sub> = the allowable oil outflow meeting §157.19(b)(1) of this part.

(3) For values of DWT between 20,000 and 200,000 DWT, the value of "J" is determined by linear interpolation between 0.45 and 0.30 respectively.

(b) PA<sub>c</sub> and PA<sub>s</sub>: *Criteria for determining the segregated ballast tanks, voids, and other spaces that do not carry cargo.*

The following criteria are to be met for a segregated ballast tank, void, or space that does not carry cargo, to be used in determining PA<sub>c</sub> and PA<sub>s</sub>:

(1) The minimum width of each wing tank or space, either of which extends for the full depth of the vessel's side or from the main deck to the top of the double bottoms is 2 meters or more. The width is measured inboard from the vessel's side shell plating at right angles to the vessel's center line. If a wing tank or space has a width anywhere within it that is less than 2 meters, that wing tank or space is not used when calculating PA<sub>c</sub>.

(2) The minimum vertical depth of each double bottom tank or space is B/15 or 2 meters, whichever is smaller. If a double bottom tank or space has a depth less than B/15 or 2 meters, whichever is smaller, anywhere within it, the double bottom or space is not to be used when calculating PA<sub>s</sub>.

(3) The minimum width of a wing tank or space is not measured in the way of—

(i) the turn of the bilge area; or

(ii) a rounded gunwale area.

(4) The minimum depth of a double bottom tank or space is not measured in the way of the turn of the bilge area.

[CGD 77-058b, 45 FR 43716, June 30, 1980]

APPENDIX D TO PART 157—EXAMPLE OF A PROCEDURE FOR DEDICATED CLEAN BALLAST TANKS OPERATIONS

1. *Source.* The example procedure for dedicated clean ballast tanks operation contained in this appendix conforms to the Annex of Resolution 14 of the MARPOL Protocol.

2. *Example Procedure.* Dedicated clean ballast tanks operational procedure:

(a) Before arrival at the loading port:

(1) Transfer all remaining slop to a cargo tank.

(2) Ensure that the pumping and piping designated for clean ballast operation have been properly cleaned to accommodate simultaneous discharge of clean ballast while loading.

(3) Ensure that all valves to the slop tank and the cargo tanks are closed.

(4) Perform visual inspection of all dedicated clean ballast tanks and their contents, if any, for signs of contamination.

(5) Discharge a sufficient amount of clean ballast water to ensure that remaining ballast water and cargo to be loaded will not exceed the permissible deadweight or draft. Leave a sufficient amount of water for flushing the piping, and as a minimum, a quantity equal to 10 times the volume of the affected piping.

(6) Ensure that all valves to the dedicated clean ballast tanks are closed.

(7) If no further ballast discharge is anticipated, drain the clean ballast piping.

(b) In the loading port:

(1) Perform normal loading operations of cargo tanks.

(2) Ensure sufficient slop tank capacity is available for subsequent reception of cargo pump and piping flushings.

(3) When applicable, discharge remaining clean ballast before entire piping system is used for loading. Leave the required minimum quantity of flushing water in ballast tanks.

(4) Ensure that all valves to the dedicated clean ballast tanks are closed.

(5) Ensure that all valves to the cargo tank are closed upon completion of loading.

(c) After departure from the loading port:

(1) Flush appropriate pumping and piping with sufficient water from dedicated clean ballast tanks into a slop tank.

(2) Ensure that valves to the slop tank are closed before pumping the remaining clean water overboard and monitoring oil content of the water.

(3) Ensure that all valves in the dedicated clean ballast tanks are closed.

(d) Before arrival at the unloading port:

(1) Ensure that all valves to the slop tank and cargo tanks are closed.

(2) Recheck that the pumping and piping designated for clean ballast operation have been properly cleaned.

(3) Ballast through clean cargo pumps and piping, considering the port's draft requirements.

(4) Ensure that all valves in the dedicated clean ballast tanks are closed.

(e) In the unloading port:

(1) Allocate pumping and piping intended for clean ballast operation.

(2) Perform normal unloading operations.

(3) As soon as draft conditions permit, complete ballasting to departure conditions.

(4) Ensure that all valves to the dedicated clean ballast tanks are closed.

(5) Complete unloading.

(f) After departure from the unloading port:

(1) Flush pumps and piping servicing the dedicated clean ballast tanks into the slop tank.

(2) Top up dedicated clean ballast tanks.

(3) Process the slop tank content in accordance with load on top (LOT) procedures.

[CGD 77-058b, 45 FR 43717, June 30, 1980]

#### APPENDIX E TO PART 157—SPECIFICATIONS FOR THE DESIGN, INSTALLATION AND OPERATION OF A PART FLOW SYSTEM FOR CONTROL OF OVERBOARD DISCHARGES

*Source.* Appendix 2 to Annex 5 of IMO's Marine Environment Protection Committee document MEPC/Circ. 97. Paragraphs 1 and 2 are printed for information. Paragraphs 3, 4, and 5 are incorporated into §§157.11 and 157.37.

*Note:* Information in square brackets on Figure 1 has been added by the Coast Guard for clarity.

##### 1 Purpose

The purpose of these Specifications is to provide specific design criteria and installation and operational requirements for the part flow system referred to in Regulation 18(6)(e) of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto.

##### 2 Application

2.1 Existing oil tankers may, in accordance with Regulation 18(6)(e) of Annex I of MARPOL 73/78, discharge dirty ballast water and oil contaminated water from cargo tank areas below the waterline, provided part of the flow is led through permanent piping to a readily accessible location on the upper deck or above where it may be visually observed during the discharge operation and provided that the arrangements comply with the requirements established by the Administration and which shall at least contain all the provisions of these Specifications.

2.2 The part flow concept is based on the principle that the observation of a representative part flow of the overboard effluent is equivalent to observing the entire effluent stream. These specifications provide the details of the design installation, and operation of a part flow system.

##### 3 General Provisions

3.1 The part flow system shall be so fitted that it can effectively provide a representative sample of the overboard effluent for visual display under all normal operating conditions.

3.2 The part flow system is in many respects similar to the sampling system for an oil discharge monitoring and control system but shall have pumping and piping arrangements separate from such a system, or combined equivalent arrangements acceptable to the Administration.

3.3 The display of the part flow shall be arranged in a sheltered and readily accessible location on the upper deck or above, approved by the Administration (e.g. the entrance to the pump room). Regard should be given to effective communication between the location of the part flow display and the discharge control position.

3.4 Samples shall be taken from relevant sections of the overboard discharge piping and be passed to the display arrangement through a permanent piping system.

3.5 The part flow system shall include the following components:

- .1 Sampling probes;
  - .2 Sample water piping system;
  - .3 Sample feed pump(s);
  - .4 Display arrangement;
  - .5 Sample discharge arrangement; and, subject to the diameter of the sample piping;
  - .6 Flushing arrangement.
- 3.6 The part flow system shall comply with the applicable safety requirements.

#### 4 System Arrangement

##### 4.1 Sampling points.

##### 4.1.1 Sampling point locations:

.1 Sampling points shall be so located that relevant samples can be obtained of the effluent being discharged through outlets below the waterline which are being used for operational discharges.

.2 Sampling points shall as far as practicable be located in pipe sections where a turbulent flow is normally encountered.

.3 Sampling points shall as far as practicable be arranged in accessible locations in vertical sections of the discharge piping.

##### 4.1.2 Sampling probes:

.1 Sampling probes shall be arranged to protrude into the pipe a distance of about one fourth of the pipe diameter.

.2 Sampling probes shall be arranged for easy withdrawal for cleaning.

.3 The part flow system shall have a stop valve fitted adjacent to each probe, except that where the probe is mounted in a cargo line, two stop valves shall be fitted in series, in the sample line.

.4 Sampling probes should be of corrosion resistant and oil resistant material, of adequate strength, properly jointed and supported.

.5 Sampling probes shall have a shape that is not prone to becoming clogged by particle contaminants and should not generate high hydrodynamic pressures at the sampling probe tip. Figure 1 is an example of one suitable shape of a sampling probe.

.6 Sampling probes shall have the same nominal bore as the sample piping.

##### 4.2 Sample piping:

.1 The sample piping shall be arranged as straight as possible between the sampling points and the display arrangement. Sharp bends and pockets where settled oil or sediment may accumulate should be avoided.

.2 The sample piping shall be so arranged that sample water is conveyed to the display arrangement within 20 seconds. The flow velocity in the piping should not be less than 2 metres per second.

.3 The diameter of the piping shall not be less than 40 millimetres if no fixed flushing arrangement is provided and shall not be less than 25 millimetres if a pressurized flushing arrangement as detailed in paragraph 4.4 is installed.

.4 The sample piping should be of corrosion-resistant and oil-resistant material, of adequate strength, properly jointed and supported.

.5 Where several sampling points are installed the piping shall be connected to a valve chest at the suction side of the sample feed pump.

##### 4.3 Sample feed pump:

.1 The sample feed pump capacity shall be suitable to allow the flow rate of the sample water to comply with 4.2.2.

##### 4.4 Flushing arrangement:

.1 If the diameter of sample piping is less than 40 millimetres, a fixed connexion from a pressurized sea or fresh water piping system shall be installed to enable flushing of the sample piping system.

##### 4.5 Display arrangement:

.1 The display arrangement shall consist of a display chamber provided with a sight glass. The chamber should be of a size that will allow a free fall stream of the sample water to be clearly visible over a length of at least 200 millimetres. The Administration may approve equivalent arrangements.

.2 The display arrangement shall incorporate valves and piping in order to allow a part of the sample water to bypass the display chamber to obtain a laminar flow for display in the chamber.

.3 The display arrangement shall be designed to be easily opened and cleaned.

.4 The internal of the display chamber shall be white except for the background wall which shall be so coloured in order to facilitate the observation of any change in the quality of the sample water.

.5 The lower part of the display chamber shall be shaped as a funnel for collection of the sample water.

.6 A test cock for taking a grab sample shall be provided in order that a sample of the water can be examined independent of that in the chamber.

.7 The display arrangement shall be adequately lighted to facilitate visual observation of the sample water.

##### 4.6 Sample discharge arrangement:

.1 The sample water leaving the display chamber shall be routed to the sea or to a slop tank through piping of adequate diameter.

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*5 Operation*

5.1 When a discharge of dirty ballast water or other oil contaminated water from the cargo tank area is taking place through an outlet below the waterline, the part flow system shall provide sample water from the relevant discharge outlet at all times.

5.2 The sample water should be observed particularly during those phases of the discharge operation when the greatest possibility of oil contamination occurs. The discharge shall be stopped whenever any traces of oil are visible in the flow and when the oil content meter reading indicates oil content exceeds permissible limits.

5.3 On those systems that are fitted with flushing arrangements, the sample piping should be flushed after contamination has been observed and additionally it is recommended that the sample piping be flushed after each period of usage.

5.4 The ship's cargo and ballast handling manuals and, where applicable, those manuals required for crude oil washing systems or dedicated clean ballast tanks operation shall clearly describe the use of the part flow system in conjunction with the ballast discharge and the slop tank decanting procedures.

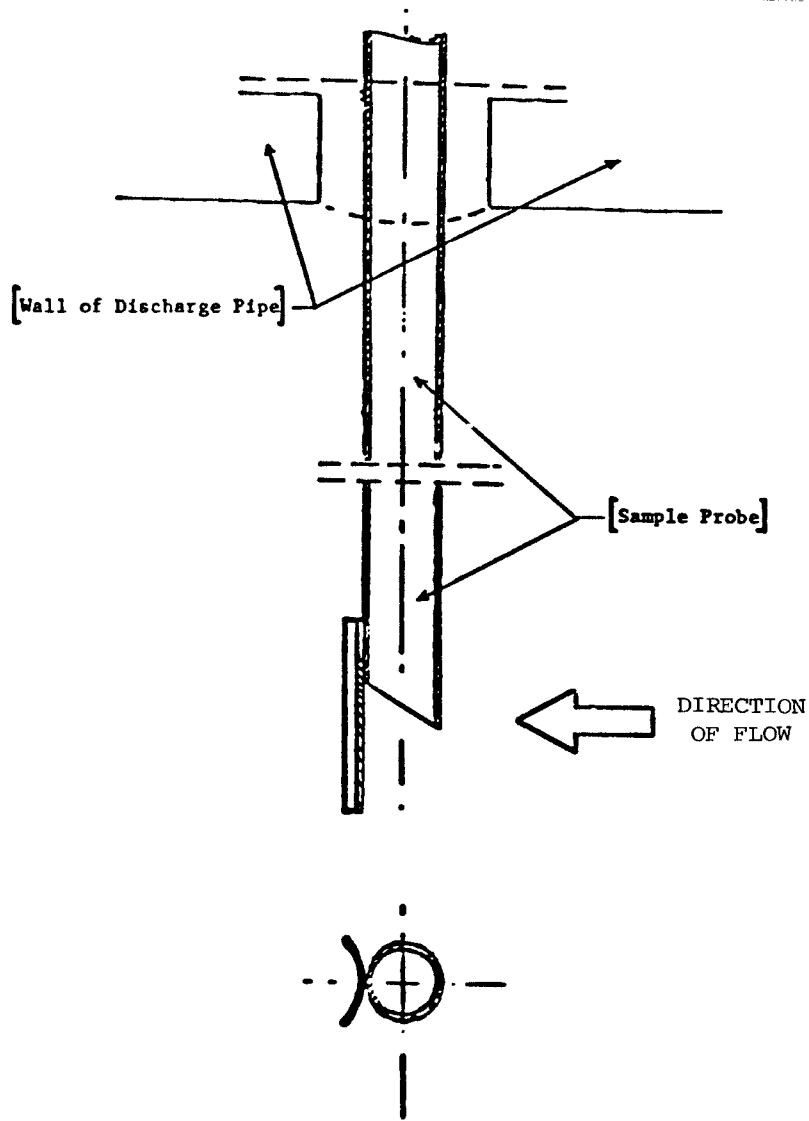


FIGURE 1

SAMPLING PROBE FOR A PART FLOW DISPLAY SYSTEM

[CGD 75-124a, 48 FR 45721, Oct. 6, 1983]

APPENDIX F TO PART 157—GUIDELINES  
AND SPECIFICATIONS FOR OIL DIS-  
CHARGE MONITORING AND CONTROL  
SYSTEMS FOR TANKERS

*Source.* IMO Resolution A.496(XII). Paragraphs 1, 2, 3, and 7 are printed for information. Paragraphs 4, 5, and 6 are incorporated into §157.12.

*Mandatory Language.* Wherever the word “should” is used in this appendix, substitute the word “shall”. Compliance with these provisions is mandatory.

*Note.* Numbered footnotes have been added by the Coast Guard for clarity. Footnotes in the original text have been inserted parenthetically in the text and are identified by an asterisk.

#### 1 Purpose

1.1 The purpose of these Guidelines and Specifications is:

.1 To provide a uniform interpretation of the requirements of Regulation 15(3)(a) of Annex I to the MARPOL 73/78 Convention(1), and

.2 To assist Administrations in determining appropriate design, construction and operational parameters for oil discharge monitoring and control systems when such systems are fitted in ships flying the flag of their State.

#### 2 Background

2.1 The requirements of Annex I to the MARPOL 73/78 Convention relating to oil content monitoring of oil tanker ballast and tank washing water are contained in Regulation 15(3)(a), which stipulates that oil tankers of 150 tons gross tonnage and above shall be equipped with an approved oil discharge monitoring and control system and that the system shall record continuously:

.1 The discharge of oil in litres per nautical mile and total quantity of oil discharge; or

.2 In lieu of the total quantity of oil discharged, the oil content of the effluent and rate of discharge.

In both cases the record shall be “identifiable as to time and date” and shall be kept for at least three years.

2.2 Regulation 15 also stipulates that the system shall come into operation when there is any discharge of effluent into the sea and shall be such as will ensure that any discharge of oily mixture is automatically stopped when the instantaneous rate of discharge of oil exceeds that permitted by Regulation 9(1)(a). In existing oil tankers the stopping of the discharge may be performed manually and the rate of discharge may be estimated from the pump characteristics.

2.3 A test and performance specification for the basic oil content meter, indicating

oil content in ppm, has been adopted by Resolution A.393(X).

2.4 Resolution A.445(XI) recognizes the need for early installation of oil discharge monitoring and control systems in order that operational experience can be gained. That resolution further invites the Marine Environment Protection Committee (MEPC) to develop guidelines for the progressive installation of oil discharge monitoring and control systems for new and existing oil tankers.

#### 3 Application

3.1 An oil discharge monitoring and control system, approved by the Administration, shall be fitted in every oil tanker of 150 tons gross tonnage and above, and shall be fitted in:

.1 New (\*as defined in Regulation 1(6))(2) tankers, on the date of entry into force of the Convention;

.2 Existing tankers, within three years of the date of entry into force of the Convention.

3.2 Existing tankers operating with a tank cleaning procedure using crude oil washing in accordance with Regulation 13(8) or with dedicated clean ballast tanks in accordance with Regulation 13(9) must fit an oil content meter not later than the first scheduled shipyard visit after entry into force of the Convention.

3.3 An incentive scheme to encourage the early installation of oil discharge monitoring and control systems (Resolution A.445(XI)) has been developed which allows different requirements depending on the date of installation of the system and the size and building date of the oil tanker. The terms used in the description of the various requirements are defined in section 4 below.

#### 4 Definitions

4.1 “Oil discharge monitoring and control system”

4.1.1 Oil discharge monitoring and control system is a general term covering any one of the units referred to in paragraphs 4.2, 4.3, and 4.4.

4.2 “Control unit”

4.2.1 A control unit is a system which receives automatic signals of:

- .1 Oil content;
- .2 Flow rate of discharge;
- .3 Ship’s speed;
- .4 Date and time (G.M.T.); and
- .5 Discharge valve position (open or closed).

4.2.2 The unit shall make automatic recordings of:

- .1 Instantaneous rate of discharge of oil;
- .2 Total quantity of oil discharged;
- .3 Date and time (G.M.T.);
- .4 Discharge valve position (open or closed);

- .5 Alarm condition;
- .6 Failure (i.e. no flow, fault etc.); and
- .7 Override action (i.e. manual override, flushing, calibration etc.).

4.2.3 The unit shall be fitted with a starting interlock and discharge valve control capability. The unit shall meet the specifications contained in the relevant paragraphs of section 6.

4.3 "Computing unit".

4.3.1 A computing unit is a system which receives automatic signals of:

- .1 Oil content;
- .2 Date and time (G.M.T.);
- .3 Discharge valve activation;
- .4 Flow rate of discharge; and
- .5 Ship's speed in knots.

The flow rate and ship's speed may be manually inserted into the unit.

4.3.2 The unit shall make automatic recordings of:

- .1 Instantaneous rate of discharge of oil;
- .2 Total quantity of oil discharged;
- .3 Date and time (G.M.T.);
- .4 Discharge valve position (open or closed);
- .5 Alarm condition;
- .6 Failure (i.e. no flow, fault etc.);
- .7 Override action;
- .8 Manual input (i.e. speed, flow); and
- .9 Oil content if the flow rate has been manually inserted.

4.3.3 Unless explicitly stated in the Implementation Requirements (see section 5 below) the unit need not be fitted with a starting interlock or discharge valve control capability.

4.3.4 The unit shall meet the specifications contained in the relevant paragraphs of section 6.

4.4 "Calculating unit".

4.4.1 A calculating unit is a system which received automatic signals of:

- .1 Oil content;
- .2 Flow rate of discharge; and
- .3 Ship's speed.

The flow rate and ship's speed may be manually inserted into the unit.

4.4.2 The unit shall make an automatic recording of:

- .1 Oil content, unless the oil content meter is provided with a recorder.

4.4.3 The unit shall display:

- .1 Instantaneous rate of discharge of oil;
- .2 Total quantity of oil discharged, unless permitted to be calculated manually.

4.4.4 The time and date, instantaneous rate of discharge of oil and, the total quantity of oil discharged may be recorded manually.

4.4.5 The unit need not be fitted with a starting interlock nor discharge valve control capability.

4.4.6 The unit shall meet the specifications contained in the relevant paragraphs of section 6.

4.5 "Starting interlock" is an automatic device which prevents the initiation of the opening of the discharge valve before the monitoring and control system is fully operational when use of this system is required by the Convention.

4.6 The "discharge valve control" is an automatic device which initiates the sequence to stop the overboard discharge.

### 5 Implementation Requirements

5.1 To assist in the implementation of Resolution A.445(XI), an implementation scheme has been developed by the MEPC which provides slightly different requirements for oil discharge monitoring and control systems depending on size and building date of the oil tanker. The scheme also allows for different requirements, depending on the installation date of the system.

5.2 Under the implementation scheme contained in paragraph 5.4 oil tankers of 150 tons gross tonnage and above have been arranged into five categories. Each category of oil tanker shall be fitted with an oil discharge monitoring and control system as set out below. The definitions given in section 4 should be consulted for a description of the different systems.

5.3 The implementation scheme set out in paragraph 5.4 gives details, with reference to paragraph 4, of the minimum equipment required to comply with this scheme. Where it is expedient to fit equipment of a higher category than required no objection shall be raised to this arrangement.

5.4 Implementation scheme:

5.4.1 Category I—

.1 An oil tanker of this category is of 4,000 tons deadweight and above and is a "new ship" as defined in Regulation 1(6) of Annex I of MARPOL 73/78 and the oil discharge monitoring and control system is installed on or after 1 June 1982.

.2 This category of ship shall be fitted with a control unit as defined under paragraph 4.2.

5.4.2 Category II—

.1 An oil tanker of this category is of 4,000 tons deadweight and above and is a "new ship" as defined in Regulation 1(6) of Annex I of MARPOL 73/78 and the oil discharge monitoring and control system is installed before 1 June 1982.

.2 This category of ship shall be fitted with a computing unit as defined under paragraph 4.3.

.3 The system shall also be fitted with a starting interlock and a discharge valve control.

5.4.3 Category III—

.1 An oil tanker of this category is of 150 tons gross tonnage and above, but less than 4,000 tons deadweight and is a "new ship" as defined in Regulation 1(6) of Annex I of MARPOL 73/78.

.2 This category of ship shall be fitted with a computing unit as defined under paragraph 4.3.

.3 No automatic devices are required to activate overboard discharge valve closure, neither is a starting interlock required.

5.4.4 Category IV(a)—

.1 An oil tanker of this category is of 20,000 tons deadweight and above and is an "existing ship" as defined in Regulation 1(7) of Annex I of MARPOL 73/78 and the oil discharge monitoring and control system is installed between one year and three years after the date of entry into force of MARPOL 73/78.

.2 This category of ship shall be fitted with a computing unit as defined under paragraph 4.3.

.3 The system shall also be fitted with a starting interlock, but need not be fitted with a discharge valve control.

.4 For oil tankers within this category up to and including 100,000 tons deadweight, where the overboard discharge has local manual control or where control is provided by means of extension rods, Administrations may grant waivers or exemptions from the requirement to fit a starting interlock system (3).

5.4.5 Category IV(b)—

.1 An oil tanker of this category is of 20,000 tons deadweight and above and is an "existing ship" as defined in Regulation 1(7) of Annex I of MARPOL 73/78 and the oil discharge monitoring and control system is installed not later than one year after the date of entry into force of MARPOL 73/78.

.2 This category of ship shall be fitted with a computing unit as defined under paragraph 4.3.

.3 No automatic devices are required to activate overboard discharge valve closure, neither is a starting interlock required.

5.4.6 Category V(a)—

.1 An oil tanker of this category is of 150 tons gross tonnage and above but less than 20,000 tons deadweight and is an "existing ship" as defined in Regulation 1(7) of Annex I of MARPOL 73/78 and the oil discharge monitoring and control system is installed between one year and three years after the entry into force of MARPOL 73/78.

.2 This category of ship shall be fitted with a calculating unit as defined under paragraph 4.4.

.3 No automatic devices are required to activate overboard discharge valve closure, neither is a starting interlock required.

5.4.7 Category V(b)—

.1 An oil tanker of this category is of 150 tons gross tonnage and above but less than 20,000 tons deadweight and is an "existing ship" as defined in Regulation 1(7) of Annex I to MARPOL 73/78 and the oil discharge monitoring and control system is installed not later than one year after the entry into force of MARPOL 73/78.

.2 This category of ship shall be fitted with a calculating unit as defined under paragraph 4.4. However, the total quantity of oil discharged may be computed manually.

.3 No automatic devices are required to activate overboard discharge valve closure, neither is a starting interlock required.

.5 Shown at the Appendix is a summary, in tabular form, of the implementation requirements (4).

## 6 Technical Specifications

6.1 Oil discharge monitoring and control system:

6.1.1 The oil discharge monitoring and control system shall be so fitted that it can effectively monitor and control the discharge of any effluent into the sea through those overboard discharge outlets permitted by Regulation 18(2) which in the opinion of the Administration are necessary to fulfill the operational requirements of the tanker (5). The system should additionally cover:

.1 The gravitational discharge of ballast water from cargo tanks; and

.2 The midship cargo manifold arrangement when used to meet the requirements of Regulation 18.

6.1.2 The discharge of dirty ballast water or oil contaminated water into the sea through outlets which are not controlled by the monitoring and control system is an infringement of the Convention (6).

6.1.3 The system should function effectively, according to the criteria shown below, under all environmental conditions which vessels are normally assumed to encounter, and shall be designed and constructed to withstand the environmental conditions as specified in paragraph 6.1.6 of these Guidelines and Specifications:

.1 Except where manual operation of the system is permitted the system shall be so designed that no ballast discharge can take place unless the monitor is in the normal operating mode and the relevant sampling point has been connected to the monitor.

.2 Preferably the system should have a minimum number of discharge outlets and sampling points so arranged that discharge can take place via only one sampling point at a time.

.3 Where it is intended that more than one line is used for simultaneous discharge purposes, one oil content meter (7), together with a flow meter, shall be installed per discharge line. These instruments shall be connected to a common processing unit.

.4 In order to avoid alarms due to short term high oil concentration signals (spikes) causing indications of high instantaneous rates of discharge, the short term high ppm signal may be suppressed for a maximum of 10 seconds by employing a delay relay. Alternatively, the instantaneous rate of discharge may be the average during the preceding 20



seconds or less as computed from instantaneous ppm values produced by the oil content meter with intervals of a maximum of 5 seconds.

6.1.4 The system should comprise the following:

.1 An oil content meter to measure the oil content of the effluent in parts per million. This meter shall be approved in accordance with the provisions contained in resolution A.393(X)(8) and certified to take into account the range of cargoes carried;

.2 A flow rate system to indicate the quantity of effluent being discharged in a unit of time (see also paragraphs 6.3.7 and 6.3.8);

.3 A vessel speed indicating device; to give the vessel's speed in knots (see also paragraphs 6.4.2 and 6.4.3);

.4 A sampling system to convey a representative sample of the effluent to the oil content meter;

.5 A control section which includes:

.5.1 A processor, which accepts signals of oil content, flow rate and the vessel's speed and converts them into litres per nautical mile and the total quantity of oil discharged (see also paragraph 6.5.3);

.5.2 A transmitting device to provide alarms and, where required, command signals to the discharge control arrangement;

.5.3 A recording device to provide, where required, a continuous record of the effluent discharge;

.5.4 A manual override system to be used in the event of failure of the monitoring and control system; and

.5.5 Where required a transmitting device to provide signals to a starting interlock preventing the discharge of effluent before the oil content meter is fully operative.

6.1.5 The electrical components of the system installed in a hazardous area of a vessel shall meet the appropriate safety requirements (\*As contained in the provisions of IEC Publication 92 or its equivalent.) (9) provided for these areas.

6.1.6 The control section of an oil discharge monitoring and control system shall be capable of operating satisfactorily under the following environmental conditions:

.1 *Ambient air temperature:* 0 °C to 55 °C in enclosed spaces; -25 °C to 55 °C on open decks

.2 *Vibration:* 2.0 Hz to 13.2 Hz, with displacement amplitude of ±1.0 mm 13.2 Hz to 80.0 Hz, with an acceleration amplitude of ±0.7 g

.3 *Voltage variations for alternating current:* permanent variation of ±10%

.4 *Inclination:* inclination at angles of up to 22.5° in any place from the normal operational position

6.2 Sampling system:

6.2.1 Sampling points should be so located that relevant samples can be obtained from those outlets that are used for operational

discharges in accordance with paragraph 6.1.1. The sampling probes located in the overboard discharge lines and the piping system connecting the sampling probes to the oil content meter should meet the following requirements:

.1 The piping and probes shall be of corrosion-resistant and oil-resistant material, of adequate strength, properly jointed and supported;

.2 The system shall have a stop valve fitted adjacent to each probe, except that where the probe is mounted in a cargo line, e.g. to the midship cargo manifold arrangement, two stop valves shall be fitted, in series, in the sample line;

.3 Sampling probes should be arranged for easy withdrawal and should as far as practicable be mounted at an accessible location in a vertical section of the discharge line. If a sampling point has to be made in a horizontal section then suitable arrangements should be made to obtain representative samples. Sampling probes should normally penetrate inside the discharge pipe to a distance of one quarter the diameter of that pipe;

.4 Means shall be provided for cleaning the probes and piping system by the provision of permanent clean water flushing arrangements or some other equivalent method, especially in the case of probes mounted in a cargo line. The design of the probes and piping should be such as to minimize their clogging by oil, oily residue and other matter;

.5 The velocity of the fluid in the piping shall be such that, taking into consideration the length of the piping, the overall response time should be as short as possible between an alteration in the mixture being pumped and the alteration in the meter reading and in any case not more than 40 seconds;

.6 The location of sampling probes in relation to any point of flow diversion to a slop tank shall be selected with regard to the need for sampling the oily water in the recirculation mode;

.7 The arrangements for driving the sampling pump or any other pumps such as those provided for washing windows shall have regard to the safety requirements of the space in which the pump is located;

.8 The flushing arrangements should be such that where necessary they can be utilized for stabilizing the oil content meter and for correcting zero setting;

.9 Sample water when returned to the slop tank shall not be allowed to free fall into the tank.

6.3 Flow rate indicating system:

6.3.1 A flow meter for measuring the rate of discharge should be installed in a vertical section of a discharge line or in any other section of discharge line as appropriate, so as to be always filled with the liquid.

6.3.2 A flow meter should employ an operating principle which is suitable for ship-board use and, where relevant, can be used in large diameter pipes.

6.3.3 A flow meter should be suitable for the full range of flow rates that may be encountered during normal operation. Alternatively, arrangements such as the use of two flow meters of different ranges or a restriction of the operational flow rate range may be necessary to meet this requirement.

6.3.4 The flow meter, as installed, should have an accuracy of  $\pm 15$  percent, or better, of the instantaneous rate throughout the operating range.

6.3.5 Any component part of the flow meter in contact with the effluent discharge including associated piping, if fitted, shall be of corrosion-resistant and oil-resistant material of adequate strength.

6.3.6 The design of the flow metering arrangements shall have regard to the safety requirements of the space in which such metering arrangements are located.

6.3.7 In ships fitted with a computing unit the flow rate may be determined from the pump characteristics and the data manually inserted into the unit.

6.3.8 In ships fitted with a calculating unit the flow rate may be manually inserted into the unit. The flow rate is to be estimated from the best available source e.g. pump characteristics, speed of pump(s), ullages or knowledge of pumping rates for particular tanks on the ship.

6.3.9 In oil tankers where the gravitational discharges of ballast water from the cargo tanks is an established practice, in accordance with Regulation 18(6)(d), means, such as calibration curves, shall be provided to estimate the flow rate of discharge.

6.4 Vessel's speed indicating system:

6.4.1 The automatic speed signal required for the control unit shall be obtained from the vessel's speed indicating device (\*See "Recommendation on Performance Standards for Devices to Indicate Speed and Distance (Annex to Resolution A.478(XII)).) by means of a repeater signal. This information shall be readily available in a form that can be accepted by a processor. The speed information used may be either speed over the ground or speed through the water depending upon the speed measuring equipment installed on board.

6.4.2 In ships where a computing unit is required the vessel's speed may be manually inserted into the unit. This data shall be obtained from the ship's log or from an indicating device which transmits signals which need not be in a form which can be accepted by a computer system.

6.4.3 The vessel's speed on ships required to install a calculating unit may be obtained from the ship's log or from the navigation charts and shall be estimated from the most reliable source.

6.5 Processor and transmitting device:

6.5.1 The processor should receive, at time intervals not exceeding 5 seconds, signals from the oil content meter, the flow rate measuring system, and the vessel's speed indicator and automatically compute the following:

.1 Instantaneous rate of discharge of oil in litres per nautical mile; and

.2 Total quantity of oil discharged per voyage in cubic meters or litres.

6.5.2 When the calculations of the processor exceed the limits imposed by Regulation 9(1)(a) (iv) and (v) (10) the transmitting device will provide alarms and, in new ships, it will also provide command signals to the discharge valve control which will cause the discharge of effluent into the sea to stop.

6.5.3 In existing ships fitted with a calculating unit where the unit is installed early, the total quantity of oil discharged may be computed manually.

6.6 Recording devices:

6.6.1 Control Unit—

.1 The recording device for a control unit should include a digital printer or an analogue recorder or the combination of both or a recorded visible display. The record shall be identifiable as to the time and date and shall be kept for at least three years (II).

.2 The data to be automatically recorded shall include at least the following items:

.2.1 Instantaneous rate of discharge of oil (litres per nautical mile);

.2.2 The total quantity of oil discharged (litres);

.2.3 Time and date (G.m.t.);

.2.4 The discharge valve position (open or closed);

.2.5 Alarm condition;

.2.6 Failure (i.e. no flow, fault, etc.); and

.2.7 Override action (i.e. manual override, flushing, calibrating, etc.).

6.6.2 Computing Unit—

.1 The recording device for a computing unit should include a digital printer or an analogue recorder or the combination of both or a recorded visible display. The record shall be identifiable as to the time and date and shall be kept for at least three years (II). Manual input information should be identifiable on the record.

.2 The data to be automatically recorded shall include at least the following items:

.2.1 Instantaneous rate of discharge of oil (litres per nautical mile);

.2.2 The total quantity of oil discharged (litres);

.2.3 Time and date (G.m.t.);

.2.4 Manual input information;

.2.5 The valve position (open or closed);

.2.6 Alarm condition;

.2.7 Failure (i.e. no flow, fault, etc.);

.2.8 Override action (i.e. manual override, flushing, calibration, etc.); and

.2.9 Oil content if flow rate is manually inserted.

## 6.6.3 Calculating Unit—

.1 An automatic recording device is not required for a calculating unit, but, where fitted, the recording device should include a digital printer or an analogue recorder or the combination of both or a recorded acceptable visible display. The record shall be identifiable as to time and date, which may be entered manually, and shall be kept for at least three years (11).

.2 The data to be automatically recorded on the above-mentioned recording device shall include at least the following item: Oil content in ppm, unless the oil content meter is provided with a recorder.

## 6.6.4 Recording for digital printers.

Occasions of recordings. Data required in paragraphs 6.6.1.2, 6.6.2.2, and 6.6.3.2 of these Specifications shall be printed out with the following minimum frequency:

- .1 When the discharge is started;
- .2 When the discharge is stopped;
- .3 At intervals of not more than 10 minutes;
- .4 When an alarm condition is developed;
- .5 When normal conditions are restored;
- .6 At the change of valve order or valve position;
- .7 When introducing input data;
- .8 Whenever the computed rate of discharge varies by 10 litres/nautical mile, unless an equivalent trend-indicating arrangement is provided;
- .9 When selecting zero setting or calibration mode; and
- .10 On manual command.

## 6.6.5 Recording for analogue recorders.

Data required in paragraphs 6.6.1.2, 6.6.2.2 and 6.6.3.2 of these Specifications should be continuously recorded in such a way as would satisfy the following requirements:

- .1 The chart speed should be indicated. If the speed is controllable, the recorder shall be provided with a marker to identify the speed of the chart paper; and
- .2 Means shall be provided to enable the chart paper to be interpreted as to time, date and readings after it has been removed from the recorder.

## 6.7 Data display.

6.7.1 The current data shall be visibly displayed.

6.7.2 The recording device and the data display should be located in a position easily accessible to the person in charge of the operation of discharging the effluent overboard.

## 6.8 Manually operated alternatives.

6.8.1 The alternative means and information for use in case of any one failure in the system should be as follows:

- .1 Oil Content meter: visual observation of the surface of the water (12);
- .2 Sampling pump: visual observation of the surface of the water;
- .3 Flow meter: pump characteristics, etc.;

.4 Vessel's speed indicating device: main engine R.P.M., etc.;

.5 Processor: manual calculation and manual recording; and

.6 Discharge valve control: manual operation of pumps and valves.

6.9 Alarm conditions resulting in the stopping of discharge.

6.9.1 Audio-visual alarms shall be initiated for any of the following conditions:

.1 Whenever the instantaneous rate of discharge of oil exceeds 60 litres per nautical mile;

.2 When the total quantity of oil discharged reaches the allowable limit prescribed by the provisions of the relevant Regulations;

.3 Failure of the system's operation, such as:

- .3.1 Power failure;
- .3.2 Loss of sample;
- .3.3 Failure of the measuring or recording system; or

.3.4 When the input signal of the sensors exceeds the effective capacity of the system.

## 6.10 Location of alarm indicator

6.10.1 The alarm indicator of the system shall be installed in the cargo control room where provided and/or other places where it will attract immediate attention and action.

## 7 Equipment, Operation and Maintenance Manuals

7.1 Administrations shall ensure that approved equipment, operational and/or maintenance manuals for the various items comprising the oil discharge monitoring and control systems are on board the vessel. These manuals shall cover the oil content meter, control, computing or calculating unit, flow meter and ship's speed indicator, where required.

## FOOTNOTES: (ADDED BY THE U.S. COAST GUARD FOR CLARITY.)

(1) The "MARPOL 73/78 Convention" is referred to as the MARPOL Protocol" in 33 CFR, Part 157.

(2) Also defined in §157.03(i).

(3) The Coast Guard has determined that a starting interlock system is not required on Category IV(a) vessels that are 100,000 DWT or less.

(4) The Coast Guard is not publishing this Appendix.

(5) Section 157.11(b)(2) requires at least one discharge point.

(6) Section 157.37(a) requires all overboard discharges of oily mixtures to be monitored.

(7) The "oil content meter" is referred to as a "cargo monitor" in 33 CFR Part 157 and 46 CFR Subpart 162.050.

(8) Approval under 46 CFR Subpart 162.050 constitutes compliance with this resolution.

Section 157.12(b) requires that monitors installed on U.S. vessels must be approved under 46 CFR Subpart 162.050.

(9) U.S. vessels are required to meet 46 CFR Parts 110-113, Electrical Engineering Regulations, which also constitutes compliance with IEC Publication 92.

(10) Sections 157.37(a) (3) and (4) impose the same limits. These limits relate to instantaneous rate and total quantity of oil discharged.

(11) Section 157.37(d) also requires that discharge data be kept for three years.

(12) Section 157.37(a)(6) also requires visual observation of the discharge if the system fails.

[CGD 75-124a, 48 FR 45723, Oct. 6, 1983]

#### APPENDIX G TO PART 157—TIMETABLES FOR APPLICATION OF DOUBLE HULL REQUIREMENTS

1. *Source.* These timetables conform to 46 U.S.C. 3703a(c).

##### 2. *Timetables.*

(a) In this section, the age of a vessel is determined from the later of the date on which the vessel is—

(1) Delivered after original construction;

(2) Delivered after completion of a major conversion; or

(3) Qualified for documentation under section 4136 of the Revised Statutes of the United States (46 U.S.C. app. 14).

(b) A vessel of less than 5,000 gross tons for which a building contract or contract for major conversion was placed before June 30, 1990, and that is delivered under that contract before January 1, 1994, and a vessel that had its appraised salvage value determined by the Coast Guard before June 30, 1990, and that qualifies for documentation under section 4136 of the Revised Statutes of the United States (46 U.S.C. app. 14) before January 1, 1994, may not operate in the navigable waters or the Exclusive Economic Zone of the United States after January 1, 2015, unless equipped with a double hull or with a double containment system determined by the Coast Guard to be as effective as a double hull for the prevention of a discharge of oil.

(c) A vessel for which a building contract or contract for major conversion was placed before June 30, 1990, and that is delivered under that contract before January 1, 1994, and a vessel that had its appraised salvage determined by the Coast Guard before June 30, 1990, and that qualifies for documentation under 46 CFR subpart 67.19 before January 1, 1994, may not operate in the navigable waters or Exclusive Economic Zone of the United States unless equipped with a double hull—

(1) In the case of vessel of at least 5,000 gross tons but less than 15,000 gross tons—

(i) After January 1, 1995, if the vessel is 40 years old or older and has a single hull, or is 45 years old or older and has a double bottom or double sides;

(ii) After January 1, 1996, if the vessel is 39 years old or older and has a single hull, or is 44 years old or older and has a double bottom or double sides;

(iii) After January 1, 1997, if the vessel is 38 years old or older and has a single hull, or is 43 years old or older and has a double bottom or double sides;

(iv) After January 1, 1998, if the vessel is 37 years old or older and has a single hull, or is 42 years old or older and has a double bottom or double sides;

(v) After January 1, 1999, if the vessel is 36 years old or older and has a single hull, or is 41 years old or older and has a double bottom or double sides;

(vi) After January 1, 2000, if the vessel is 35 years old or older and has a single hull, or is 40 years old or older and has a double bottom or double sides;

(vii) After January 1, 2005, if the vessel is 25 years old or older and has a single hull, or is 30 years old or older and has a double bottom or double sides;

(2) In the case of a vessel of at least 15,000 gross tons but less than 30,000 gross tons—

(i) After January 1, 1995, if the vessel is 40 years old or older and has a single hull, or is 45 years old or older and has a double bottom or double sides;

(ii) After January 1, 1996, if the vessel is 38 years old or older and has a single hull, or is 43 years old or older and has a double bottom or double sides;

(iii) After January 1, 1997, if the vessel is 36 years old or older and has a single hull, or is 41 years old or older and has a double bottom or double side;

(iv) After January 1, 1998, if the vessel is 34 years old or older and has a single hull, or is 39 years old or older and has a double bottom or double sides;

(v) After January 1, 1999, if the vessel is 32 years old or older and has a single hull, or is 37 years old or older and has a double bottom or double sides;

(vi) After January 1, 2000, if the vessel is 30 years old or older and has a single hull, or is 35 years old or older and has a double bottom or double sides;

(vii) After January 1, 2001, if the vessel is 29 years old or older and has a single hull, or is 34 years old or older and has a double bottom or double sides;

(viii) After January 1, 2002, if the vessel is 28 years old or older and has a single hull, or is 33 years old or older and has a double bottom or double sides;

(ix) After January 1, 2003, if the vessel is 27 years old or older and has a single hull, or is 32 years old or older and has a double bottom or double sides;

(x) After January 1, 2004, if the vessel is 26 years old or older and has a single hull, or is 31 years old or older and has a double bottom or double sides;

(xi) After January 1, 2005, if the vessel is 25 years old or older and has a single hull, or is 30 years old or older and has a double bottom or double sides; and

(3) In the case of a vessel of at least 30,000 gross tons—

(i) After January 1, 1995, if the vessel is 28 years old or older and has a single hull, or is 33 years old or older and has a double bottom or double sides;

(ii) After January 1, 1996, if the vessel is 27 years old or older and has a single hull, or is 32 years old or older and has a double bottom or double sides;

(iii) After January 1, 1997, if the vessel is 26 years old or older and has a single hull, or is 31 years old or older and has a double bottom or double sides;

(iv) After January 1, 1998, if the vessel is 25 years old or older and has a single hull, or is 30 years old or older and has a double bottom or double sides;

(v) After January 1, 1999, if the vessel is 24 years old or older and has a single hull, or is 29 years old or older and has a double bottom or double sides;

(vi) After January 1, 2000, if the vessel is 23 years old or older and has a single hull, or is 28 years old or older and has a double bottom or double sides;

(d) Except as provided in paragraph (b) of this section—

(1) A vessel that has a single hull may not operate after January 1, 2010, and

(2) A vessel that has a double bottom or double sides may not operate after January 1, 2015.

**NOTE:** Double sides and double bottoms must meet the requirements in §157.10d(c) or (d), as appropriate. A vessel will be considered to have a single hull if it does not have double sides and a double bottom that meet the requirements in §157.10d(c) and §157.10d(d). To determine a tank vessel's double hull compliance date under OPA 90, use the vessel's hull configuration (*i.e.*, single hull; single hull with double sides; or single hull with double bottom) on August 18, 1990. The conversion of a single hull tank vessel to include only double sides or only a double bottom after August 18, 1990, will not result in a change of the vessel's originally scheduled phase-out date. The conversion of a single hull tank vessel to a double hull tank vessel meeting the requirements of §157.10d complies with OPA 90.

[CGD 90-051, 57 FR 36245, Aug. 12, 1992, as amended by USCG-1999-6164, 65 FR 39262, June 23, 2000]

## PART 158—RECEPTION FACILITIES FOR OIL, NOXIOUS LIQUID SUBSTANCES, AND GARBAGE

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