

(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, as amended by USCG-2000-7641, 66 FR 55573, Nov. 2, 2001]

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.

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

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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.

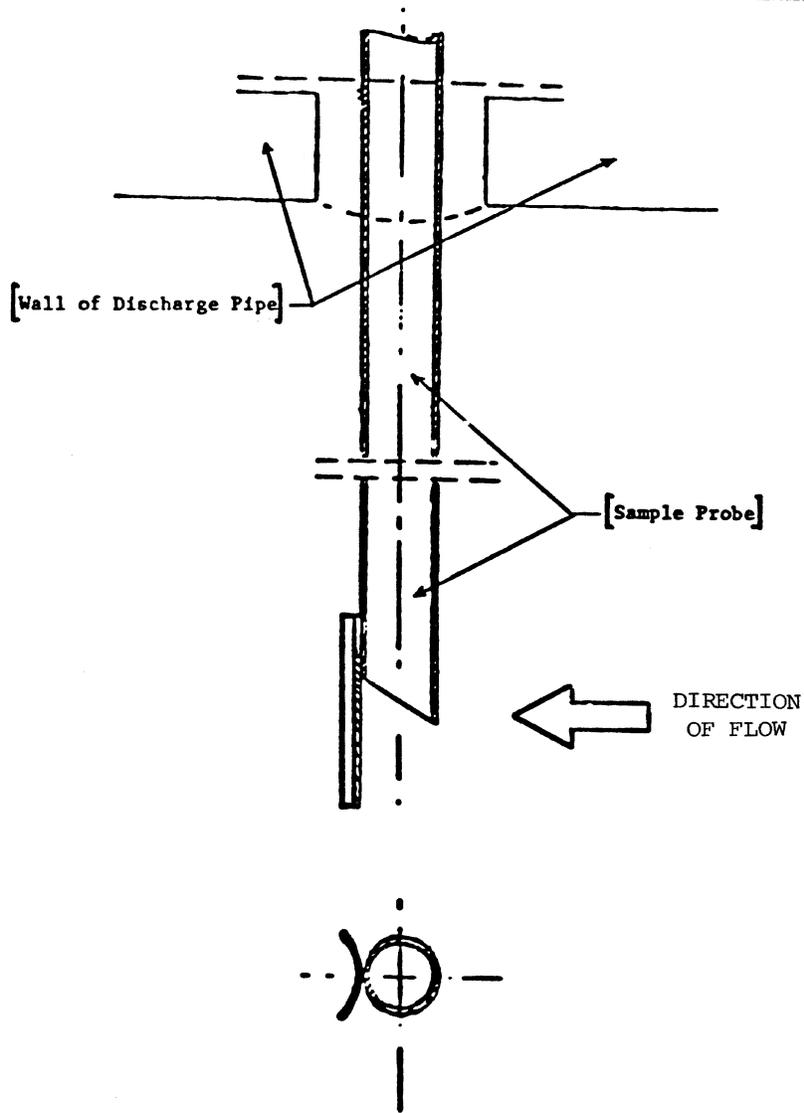


FIGURE 1

SAMPLING PROBE FOR A PART FLOW DISPLAY SYSTEM

[CGD 75-124a, 48 FR 45721, Oct. 6, 1983]