

RESOLUTION MEPC.13(19)

adopted on 9 December 1983

GUIDELINES FOR PLAN APPROVAL AND INSTALLATION SURVEY
OF OIL DISCHARGE MONITORING AND CONTROL SYSTEMS FOR
OIL TANKERS AND ENVIRONMENTAL TESTING OF CONTROL
SECTIONS THEREOF

ANNEX 6

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MONITORING AND CONTROL SYSTEMS FOR OIL TANKERS AND ENVIRONMENTAL
TESTING OF CONTROL SECTIONS THEREOF

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 39 of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee,

NOTING Assembly resolution A.543(13) concerning accuracy of oil content meters by which the Committee was requested to continue its efforts towards improving the reliability and accuracy of oil discharge monitoring and control systems for oil tankers,

RECALLING resolution MEPC.10(18) on the Application Scheme for Oil Discharge Monitoring and Control Systems by which it resolved, inter alia, to develop as soon as possible, means of improving the performance of oil discharge monitoring and control systems,

RECALLING FURTHER resolution MEPC.11(18) on Guidelines for Surveys under Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, in which references are made to the Guidelines for installation approval and on-board testing of installation arrangements of oil discharge monitoring and control system being developed by the Organization,

BELIEVING that the ensurance of the proper installation of oil discharge monitoring and control system and environmental testing of its control section will improve the reliability of the system,

HAVING CONSIDERED the proposals of Member Governments,

1. ADOPTS the Guidelines for Plan Approval and Installation Survey of Oil Discharge Monitoring and Control Systems for Oil Tankers and Environmental Testing of Control Sections Thereof, the text of which is set out at the Annex to this resolution;
2. URGES Governments to use these Guidelines when approving and surveying on board the installation of oil discharge monitoring and control systems under Regulation 15(3)(a) of Annex I of MARPOL 73/78.

ANNEX

GUIDELINES FOR PLAN APPROVAL AND INSTALLATION SURVEY
OF OIL DISCHARGE MONITORING AND CONTROL SYSTEMS FOR OIL
TANKERS AND ENVIRONMENTAL TESTING OF CONTROL SECTIONS THEREOF

1 Introduction

1.1 The technical and operational standard for oil discharge monitoring and control systems are contained in two Assembly Resolutions:

A.393(X) - Recommendations on International Performance and Test Specifications for Oily-Water Separating Equipment and Oil Content Meters, Part III; and

A.496(XII) - Guidelines and Specifications for Oil Discharge Monitoring and Control Systems for Oil Tankers.

1.2 The Recommendations contained in this document give additional guidance in the following areas:

- .1 Procedures and requirements for plan approval of installations;
- .2 Workshop functional tests of oil content meters and control system;
- .3 Guidelines for survey of installations on board; and
- .4 Environmental testing of control sections.

1.3 These Guidelines are developed for oil discharge monitoring and control system for oil tankers with control unit, according to the Guidelines and Specifications for Oil Discharge Monitoring and Control System contained in resolution A.496(XII). For installations which, in accordance with resolution A.496(XII), are less complex due to the category of the tanker, the requirements contained in these Guidelines should be applied as relevant.

2 Procedures and Requirements for Plan Approval

2.1 Adequate documentation should be prepared well in advance of the intended installation of an oil discharge monitoring and control system and be submitted to the Administration for approval. The documentation to be submitted should include at least all the following:

- .1 A description of the system including identification of the category of system applicable to the oil tanker according to the Guidelines in resolution A.496(XII). The description should identify the operational outlets for oil-contaminated water from the cargo area and should be compatible with operational requirements spelled out in the tanker's COW and/or CBT manuals or cargo and ballast handling manuals as appropriate. Special considerations may have to be given to installations in vessels having unusual pumping and piping arrangements;
- .2 equipment manuals for major components of the system;
- .3 an operations and technical manual for the complete oil discharge monitoring and control system proposed to be installed in the tanker. This manual should cover the arrangements and operation of the system as a whole and should specifically describe parts of the system which are not covered by the equipment manufacturer's manuals;

the operations section of the manual should include normal operational procedures and procedures for discharge of oily-water in case of malfunction of the equipment. The instruction should, for systems fitted with a calculating unit, include detailed procedures for assessing, during each phase of the discharge operations, the oil discharge rate and the total quantity of oil discharged;

the technical section of the manual should include adequate information (description and diagrammatic drawings of the system, wiring diagram) to enable fault finding and should include instructions for the keeping of a maintenance record;

- .4 a technical installation specification including location and mounting of components, arrangements for maintaining the integrity of the boundary between safe and hazardous spaces, and arrangements of the sample piping including calculation of the sample delay time;
- .5 a copy of the certificate of type test for the oil content meter and documentation relevant to other main components, e.g. a copy of test protocol covering environmental tests of the control section; and
- .6 a recommended test and check-out procedure developed for the specific installation. This procedure should include all checks required in a functional test by the installation contractor and should provide guidance for the surveyor when carrying out the on board survey.

2.2 Functional test referred to in 2.1.6 above should include at least all the following tests when the system is operating on water:

- .1 verify correct running of pumps, absence of leakage in the entire system, correct functioning of remote controlled sampling valves, etc. Verify adequacy of the sample discharge piping from the monitor;
- .2 verify by checking flow rates or pressure drops, as appropriate, that the system operates under correct flow conditions. This test should be repeated separately for each sampling point;
- .3 verify the function of alarms based on conditions external to the monitoring equipment, such as no sample flow, no flow meter signal, no power;
- .4 vary the input signals manually whilst the monitor is operating on water and check the recordings for correct values and timing. Vary the manual input signals until alarm conditions are obtained, verify proper recordings and opening and closing of the relevant recirculation and overboard valves;

- .5 verify that normal operating condition can be reset when the litre per nautical mile value is again lowered below discharge limit;
- .6 activate the overboard discharge valve override selector and verify that recording is made and that the overboard valves can be opened;
- .7 turn off the system and verify that opening of overboard discharge valves cannot be activated (applicable to tankers having a starting interlock system);
- .8 start up the system and check the gain setting for the oil content meter, as per the instruction manual; and
- .9 check the accuracy of any installed flow meter, for example, by pumping water in a loop where the flow rate may be calculated from the level change in a tank. Check should be made at a flow rate of about 50% of the rated flow of the meter.

3 Workshop functional Tests for Oil Content Meters and Control Sections

3.1 Each oil content meter and each control section should be subjected to a functional test in a suitable test bench prior to delivery. The detailed programme for a functional test of an equipment should be developed by the manufacturer and be approved by the Administration of the manufacturer's home country, taking into account the features and functions of the specific design of equipment. A completed workshop certificate including the delivery test protocol should be supplied with each unit being delivered.

3.2 A functional test of an oil content meter should include at least all the following:

- .1 check of flow rate or pressure drop as appropriate;
- .2 check of all alarm functions built into the meter;
- .3 check of all external switching functions; and
- .4 check of correct reading at several ppm values on all measurement scales when operated on an oil appropriate for the application of the meter or by an equivalent method.

3.3 A functional check of a control section should include at least all the following:

- .1 check all alarm functions built into the control system;
- .2 check correct function of the signal processor and the recording equipment when simulated input signals for ppm, flow rate and speed are varied;
- .3 check that alarm is obtained when the input signals are varied so that the alarm levels are exceeded;
- .4 check that discharge valve closing signal is given when alarm condition is reached;
- .5 check that alarm is obtained when each one of the input signals is varied beyond the operating limits.

4 Procedures and Requirements for Surveying the Installation Arrangements and Testing the Operation of Oil Discharge Monitoring and Control Systems

4.1 The on-board survey and functional test should be based on approved installation arrangements, descriptions and procedures provided at the plan approval stage. These procedures should be followed when the installation is surveyed in accordance with item 2.4.2.4.2 of the Guidelines for Surveys under Annex I of MARPOL 73/78 adopted under resolution MEPC.11(18).

4.2 Installation Survey

- .1 verify that the following documentation is on board in a suitable format for permanent use:
 - certificate of type test for the oil content meter.
 - environmental test protocol for the control section.
 - equipment manuals for major components of the system.
 - operations manual approved by the Administration which should include technical description of the system, operational procedures and backup procedures in case of equipment malfunction.
 - installation specification.
 - installation check-out procedures.

- .2 verify the completeness of the workshop certificate for the oil content meter and the control system;
- .3 verify that the installation has been carried out in accordance with the approved specification and;
- .4 verify that the workmanship is satisfactory and in particular that the bulkhead penetrations are to the relevant approved standard .

4.3 Installation Performance Test

- .1 Operate the equipment according to the approved check-out procedure according to item 2.6 of these Guidelines and perform all the tests listed.

5 Environmental Testing and Approval of the Control Section of an Oil Discharge Monitoring and Control System

5.1 A control section of an oil discharge monitoring and control system should satisfy all the technical and functional requirements contained in resolution A.496(XII) and the recommended additional tests described in this section. One control section of a manufacturer's standard production configuration should be subjected to environmental tests according to this programme at a laboratory, approved for the purpose by the Administration or by the competent authority of the manufacturer's home country. A copy of the environmental test protocol, properly identifying the type and model of equipment, should be included in the documentation presented at the plan approval stage.

Test specification

5.2 Equipment shall operate satisfactorily on completion of each of the following environmental tests:

.1 Vibration tests

.1.1 a search should be made for resonance over the following range of frequency and amplitude or acceleration:

- .1 2-13.2 Hz with an amplitude of ± 1 mm; and
- .2 13.2-80 Hz with an acceleration of ± 0.7 g.

This search should be made in each of the three planes at a rate sufficiently low to permit detection of resonance;

- .1.2 the equipment should be vibrated in the plane(s) at each major resonant frequency for the period of two hours;
 - .1.3 if there is no resonant frequency, the equipment should be vibrated in each of the planes at 30 Hz with an acceleration of ± 0.7 g for the period of two hours;
 - .1.4 after the tests according to .1.2 or .1.3 above a search should again be made for resonance.
- .2 Temperature tests
- .2.1 Equipment that may be installed in exposed areas on the open deck, or in an enclosed space not environmentally controlled, should be subject to, for a period of not less than 2 hours:
 - .2.1.1 A low temperature test of -25°C .
 - .2.1.2 A high temperature test of 55°C .
 - .2.2 Equipment that may be installed in an enclosed space, that is environmentally controlled, should be subject to, for a period of not less than two hours:
 - .2.2.1 A low temperature test of 0°C .
 - .2.2.2 A high temperature test of 55°C .

At the end of each of the tests referred to above, the equipment should be switched on and function normally under the test conditions.

.3 Humidity tests

- .3.1 Equipment should be left switched off for a period of 2 hours at 55°C temperature in an atmosphere with a relative humidity of 90%. At the end of this period the equipment should be switched on and should operate satisfactorily for one hour.

.4 Protection against heavy seas tests

Equipment that may be installed in exposed areas on the open deck shall be subjected to tests for protection against heavy seas in accordance with IP 56 of IEC publications 529 or its equivalent.

.5 Fluctuation in power supply

Equipment should operate satisfactorily with:

.5.1 A voltage variation of $\pm 10\%$ together with simultaneous frequency variation of $\pm 5\%$;

.5.2 A transient voltage of $\pm 20\%$ together with simultaneous frequency transient of $\pm 10\%$ with transient recovery time of 3 seconds.

.6 Inclination test

Equipment should operate satisfactorily at angles of inclination up to 22.5° in any plane from the normal operating position.

.7 Reliability of electrical and electronic equipment

The electrical and electronic components of the equipment should be of a quality guaranteed by the manufacturer and suitable for their intended duties.

Format of Test Protocol

5.3 Satisfactory compliance with the requirements of this paragraph should be shown on a protocol issued by the testing laboratory and including all the following:

- .1 identification of the equipment by type and drawing number duly dated; and
- .2 details of the test and the results thereof.

The test Protocol should confirm that the laboratory is approved for the purpose of this test and should be duly signed and dated by the officer responsible for the laboratory.

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