

RESOLUTION A.444(XI)

Adopted on 15 November 1979
Agenda item 11

**RECOMMENDATION CONCERNING THE INSTALLATION OF
OILY-WATER SEPARATING EQUIPMENT UNDER THE
INTERNATIONAL CONVENTION FOR THE PREVENTION OF
POLLUTION FROM SHIPS, 1973 AS MODIFIED BY THE
PROTOCOL OF 1978 RELATING THERETO**

THE ASSEMBLY,

RECALLING resolution A.297(VIII) by which it established the Marine Environment Protection Committee and specified the functions and responsibilities of that Committee,

RECALLING ALSO Regulation 16 of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973 (1973 MARPOL Convention) which *inter alia* requires ships above 400 tons gross tonnage to be fitted with oily-water separating equipment or oil filtering systems,

RECALLING FURTHER that by resolution A.393(X) it adopted the Recommendation on International Performance and Test Specifications for Oily-Water Separating Equipment and Oil Content Meters,

NOTING that many ships are already equipped with oily-water separating equipment under the 1969 amendments to the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, or under national legislation which do not necessarily meet the provisions of the Recommendation annexed to resolution A.393(X),

RECOGNIZING the need for uniform requirements for the installation of oily-water separating equipment, oil filtering system and oil discharge monitoring and control system to comply with the provisions of Regulation 16 of Annex I of the 1973 MARPOL Convention, which should be achieved by the installation either of new equipment or of supplementary units attached to the existing equipment,

HAVING CONSIDERED the recommendation made by the Marine Environment Protection Committee at its eleventh session,

1. ADOPTS the Recommendation concerning the Installation of Oily-Water Separating Equipment under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, the text of which is set out in the Annex to the present resolution;
2. URGES Governments to implement the Recommendation as soon as possible;
3. INVITES Governments to provide IMCO with information on experience gained from their application and, in particular, on successful testing of the process units against the specifications contained in Appendix 1 to the Recommendation.

ANNEX

**RECOMMENDATION CONCERNING THE INSTALLATION OF
OILY-WATER SEPARATING EQUIPMENT UNDER THE
INTERNATIONAL CONVENTION FOR THE PREVENTION OF
POLLUTION FROM SHIPS, 1973 AS MODIFIED BY THE
PROTOCOL OF 1978 RELATING THERETO**

1 INTRODUCTION

1.1 Under Regulation 16 of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973 (1973 MARPOL Convention),* as modified by the Protocol of 1978 relating thereto:

- .1 ships of 400 tons gross tonnage and above but less than 10,000 tons gross tonnage must be fitted with approved oily-water separating equipment or a filtering system (capable of producing effluent with an oil content of less than 100 ppm) (Regulation 16(1) and (6)); and
- .2 ships of 10,000 tons gross tonnage and above, and ships of 400 tons gross tonnage and above but less than 10,000 tons gross tonnage carrying large quantities of fuel oil, must either:
 - .2.1 be fitted with approved oily-water separating equipment or a filtering system (capable of producing effluent with an oil content of less than 100 ppm) and an approved oil discharge monitoring and control system (Regulation 16(2)(a) and (5)); or
 - .2.2 be fitted with approved oily-water separating equipment and effective filtering equipment (capable of producing effluent with an oil content not exceeding 15 ppm) and be provided with alarm arrangements to indicate when this level cannot be maintained (Regulation 16(2)(b), (6) and (7)).

1.2 This Recommendation is intended to provide guidance to Administrations in establishing national programmes for dealing with existing oily-water separating equipment in order to bring such equipment into compliance with the provisions of the 1973 MARPOL Convention as modified by the 1978 Protocol. It applies to all ships of 400 tons gross tonnage and above covered by Regulation 16 of Annex I of the 1973 MARPOL Convention as modified by the 1978 Protocol.

1.3 For the purpose of this Recommendation, existing equipment means equipment which was installed on board a ship on or before 20 January 1979.

1.4 This Recommendation assumes that all oily-water separating equipment installed on board ship after 20 January 1979 is of the type approved under the terms of resolution A.393(X). In cases where equipment installed after 20 January 1979 is not of the type approved under the terms of resolution A.393(X) or does not comply with the provisions of Regulation 16 of Annex I of the 1973 MARPOL Convention, Administrations should take necessary measures in order to ensure that such installations are brought at least to the standards laid down in this Recommendation.

1.5 This Recommendation also assumes that all ships of 500 tons gross tonnage and above have complied with the provisions of the Recommendation concerning Oily-Water Separating Equipment under the 1969 amendments to the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as contained in document MEPC VIII/17, Annex V and circulated

* Regulations referred to in this Recommendation are those of Annex I of the 1973 MARPOL Convention.

under cover of MEPC/Circ.56 of 30 December 1977. The text of that Recommendation is reproduced in Appendix 2 to the present Recommendation. Ships which have not yet complied with that Recommendation should, without delay, be brought to the standards laid down in that Recommendation.

1.6 For the purposes of the present Recommendation:

- .1 "oily-water separating equipment" means a separator or filter, or any combination thereof, which is designed to produce effluent containing less than 100 ppm of oil, in compliance with Regulation 16(6);
- .2 "oil filtering equipment" means any combination of a separator and a filter or coalescer which is designed to produce effluent containing not more than 15 ppm of oil, in compliance with Regulation 16(6) and (7);
- .3 "oil content meter" means an oil discharge monitoring system referred to in Regulation 16(5);
- .4 "recording device" means a device to provide a continuous record of the oil content in parts per million, as required by Regulation 16(5);
- .5 "15 ppm alarm" means an alarm arrangement to indicate when the oil content of the effluent exceeds 15 ppm. An oil content meter approved for "15 ppm bilge or fuel tank ballast alarm" under the terms of resolution A.393(X) satisfies the requirements for 15 ppm alarm.

2 EXISTING EQUIPMENT ON BOARD SHIPS OF 10,000 TONS GROSS TONNAGE AND ABOVE AND SHIPS OF 400 TONS GROSS TONNAGE AND ABOVE BUT LESS THAN 10,000 TONS GROSS TONNAGE CARRYING LARGE QUANTITIES OF FUEL OIL

2.1 Ships with no installed equipment

Such ships should either:

- .1 be fitted with oily-water separating equipment for 100 ppm and an oil content meter of a type approved under the terms of resolution A.393(X) and be provided with a recording device; or
- .2 be fitted with oil filtering equipment for 15 ppm of a type approved under the terms of resolution A.393(X) and be provided with a 15 ppm alarm.

2.2 Existing non-approved equipment

Such equipment should be replaced with equipment specified in either 2.1.1 or 2.1.2 above.

2.3 Existing equipment approved under national standards or under resolution A.233(VII)

Such equipment may continue to be used until it must be replaced with new equipment due to age or failure, provided that either of the following conditions is complied with:

- .1 it is fitted with an oil content meter of a type approved under the terms of resolution A.393(X) and is provided with a recording device; or
- .2 it is fitted with ancillary coalescers or filters for 15 ppm of a type approved by the Administration under the terms of the specifications for process units intended for attachment to existing oily-water separating equipment as shown in Appendix 1 hereto, and is provided with a 15 ppm alarm.

2.4 Existing equipment approved under the terms of resolution A.393(X)

Such equipment:

- .1 if it is oil filtering equipment for 15 ppm and is provided with a 15 ppm alarm, may continue to be used, provided that it remains in good working order; or
- .2 if it is oily-water separating equipment for 100 ppm, should either:
 - .2.1 be fitted with an oil content meter of a type approved under the terms of resolution A.393(X) and be provided with a recording device; or
 - .2.2 be fitted with ancillary coalescers or filters for 15 ppm of a type approved by the Administration under the terms of the specifications for process units intended for attachment to existing oily-water separating equipment, as shown in Appendix 1 hereto, and be provided with a 15 ppm alarm.

3 EXISTING EQUIPMENT ON BOARD SHIPS OF 400 TONS GROSS TONNAGE AND ABOVE BUT LESS THAN 10,000 TONS GROSS TONNAGE

3.1 Ships with no installed equipment

Such ships should be fitted with oily-water separating equipment of a type approved under the terms of resolution A.393(X).

3.2 Existing non-approved equipment

Such equipment should:

- .1 be replaced with oily-water separating equipment of a type approved under the terms of resolution A.393(X); or
- .2 be fitted with an oil content meter of a type approved under the terms of resolution A.393(X).

3.3 Existing equipment approved under national standards not based on resolution A.233(VII)

Such equipment may continue to be used until it must be replaced with new equipment due to age or failure, provided that either:

- .1 it is fitted with an oil content meter of a type approved under the terms of resolution A.393(X); or
- .2 it complies with all of the following conditions:
 - .2.1 the system is fitted with ancillary coalescers or filters of a type approved by the Administration under the terms of the specifications for process units intended for attachment to existing oily-water separating equipment as shown in Appendix 1 hereto;
 - .2.2 the residence time* of the system is not less than 10 minutes; and
 - .2.3 the system is modified for automatic operation if the mode of operation makes this necessary.

3.4 Existing equipment approved under the terms of resolution A.233(VII) or equivalent national standards

Such equipment may continue to be used until it must be replaced with new equipment due to age or failure, provided that any one of the following conditions is complied with:

- .1 it has received type approval by a retest under the terms of resolution A.393(X); or

* Residence time is defined as
$$\frac{\text{Volume of equipment (m}^3\text{)}}{\text{Throughput of equipment (}\frac{\text{m}^3}{\text{min}}\text{)}}$$

- .2 it is fitted with an oil content meter of a type approved under the terms of resolution A.393(X); or
- .3 it is fitted with an ancillary coalescer or filter of a type approved by the Administration under the terms of the specifications for process units intended for attachment to existing oily-water separating equipment as shown in Appendix 1 hereto; or
- .4 it complies with all of the following conditions:
 - .4.1 the physical condition and the arrangement of the equipment continue to be to the satisfaction of the Administration;
 - .4.2 the equipment is so arranged that the input is restricted in a permanent manner to the maximum rated figure and that the residence time within the separator is not less than 20 minutes;
 - .4.3 the emulsifying characteristics of the supply pump are no worse than those of the pump used for the test for type approval; and
 - .4.4 the arrangements on each ship for minimizing the entry of oil in the bilges are to the satisfaction of the Administration.

3.5 Existing equipment approved under the terms of resolution A.393(X)

Such equipment may continue to be used, provided that it remains in good working order.

4 GENERAL PROVISIONS

4.1 The provisions of sections 2 and 3 of this Recommendation are intended to cover primarily existing ships as defined in Regulation 1(7) of Annex I of the 1973 MARPOL Convention. Existing equipment on board new ships as defined in Regulation 1(6) may be treated in the same manner as for existing ships under sections 2 and 3 of this Recommendation, provided that new ships of 10,000 tons gross tonnage and above, complying with Regulation 16(2)(a), or of 400 tons gross tonnage and above but less than 10,000 tons gross tonnage carrying large quantities of fuel oil and complying with Regulation 16(2)(a), are fitted with an automatic stopping device required by Regulation 16(5).

4.2 In cases where an oil content meter is to be installed supplementary to existing equipment, Administrations should satisfy themselves that such existing equipment is still capable of producing effluent with an oil content of less than 100 ppm under the original conditions of test. If not, process units should be installed.

4.3 Nothing in this Recommendation should be construed as preventing ships from installing equipment having standards higher than those set out in sections 2 and 3, e.g. the installation of new equipment approved under the terms of resolution A.393(X) in lieu of continuing use of existing equipment in association with supplementary equipment, or oil filtering equipment for 15 ppm in lieu of oily-water separating equipment for 100 ppm. In this connexion, the attention of the Administration is drawn to the possible need for ships of less than 10,000 tons gross tonnage to install equipment capable of producing effluent with an oil content not exceeding 15 ppm, if such ships are intended to be engaged in trades in special areas under the 1973 MARPOL Convention or in coastal trades where discharge from machinery space bilges within 12 nautical miles from the nearest land is envisaged.

4.4 In all cases where existing equipment not approved under the terms of resolution A.393(X) is allowed under sections 2 and 3 of this Recommendation to continue to be used until it must be replaced with new equipment due to age or failure, such continuing use should be allowed only if all of the following conditions are complied with:

- .1 the equipment is in good working order;
- .2 no unauthorized modifications have been made to the system; and

.3 the system is complete and any internal corrosion is within acceptable limits.

4.5 Whenever existing equipment is to be replaced with new equipment due to age, failure or otherwise, the new equipment should be of a type approved under the terms of resolution A.393(X).

APPENDIX 1

SPECIFICATIONS FOR PROCESS UNITS INTENDED FOR ATTACHMENT TO EXISTING OILY-WATER SEPARATING EQUIPMENT

1 **General provisions**

1.1 The equipment tested under these specifications should have such capacity that when attached to existing oily-water separating equipment, having either approval under a national standard or approval under resolution A.233(VII) of the IMCO Assembly, and its supply pump, neither the separator nor the attached equipment can be subjected to a flow rate higher than that stated in the relevant certificate.

1.2 Where a range of process units, intended for attachment to existing oily-water separating equipment, of the same design but of different capacities, requires certification in accordance with these specifications and where the largest capacity in the range does not exceed 50 cubic metres/hour, the Administration may accept tests on two capacities within the range, in lieu of tests on every size, provided that the two tests actually performed are for the lowest quarter and highest quarter of the range.

2 **Technical specifications**

2.1 These specifications relate to equipment (i.e. coalescers or filters) of low to medium capacity intended for attachment to oily-water separating plants to enable the oil content in the effluent, when the oil content of the influent to the equipment is not less than 3,000 ppm, to be reduced to less than 100 ppm, or not exceeding 15 ppm when the equipment is to be approved for the coalescers or filters for 15 ppm. The approval should clearly indicate the accepted application.

2.2 The equipment should be strongly constructed and suitable for shipboard use, bearing in mind its location in the ship.

2.3 The satisfactory functioning of the equipment should not be affected by the movements and vibrations experienced on board ship. Any electrical and electronic alarm and control arrangements should be tested to show that they are capable of continued operation under vibration conditions as follows:

- .1 from 2 Hz to 13.2 Hz with an amplitude of ± 1 mm, and
- .2 from 13.2 Hz to 80 Hz with an acceleration amplitude of $\pm 0.7 g$.

Additionally, the equipment should be capable of reliable operation at angles of up to 22.5° in any plane from the normal operational position.

2.4 The equipment should meet the same electrical safety standards as are applicable to the oily-water separating equipment to which it is to be attached.

2.5 When fitted in unattended machinery spaces the equipment should be capable of operating for at least 24 hours of normal duty without attention.

2.6 All working parts of the equipment which are liable to wear or to damage should be easily accessible for maintenance.

2.7 The equipment should be fitted with a permanently attached plate giving any operational or installation limits considered necessary by the manufacturer or the Administration, including information on the maximum throughput and maximum pressure for which the unit has been tested.

2.8 If the equipment uses regenerated or replaceable elements, the regeneration or replacement cycle should be positively indicated by a means giving satisfactory protection against element saturation. The means selected should be suitable and reliable for the type of element used.

3 Test specifications

3.1 These test standards refer to equipment of low or medium capacity (up to about 50 cubic metres/hour).

3.2 The test rig should be as laid out in figure 1(a) in the Annex to resolution A.393(X).

3.3 As the influent to the equipment will contain only low concentrations of oil it will be necessary to provide an accurate oil metering pump or system.

3.4 To simulate the worst conditions which would apply at the mixture discharge of a separator, a centrifugal pump having the capacity of the maximum throughput of the equipment and operating at not less than 1,000 revolutions per minute should be used as the supply pump.

3.5 It is preferable that the pipe between the outlet of the pump and the inlet to the equipment should be of the same diameter as the equipment inlet; any difference in diameter between the pump outlet and the inlet to the equipment should be taken up by a tapered section at the pump end of the pipe and the length of the parallel section of the supply pipe should be not less than 20 times its diameter.

3.6 The sampling arrangements should be as shown in figure 2 in the Annex to resolution A.393(X).

3.7 Sampling points should be in pipes running vertically and free flow should be effected for at least one minute before any sample is taken.

3.8 Tests should be carried out within the range 10°C to 30°C.

3.9 The tests should be performed using two grades of oil. One should be a fuel oil having a relative density of about 0.94 at 15°C and a viscosity of not less than 220 centistokes (about 900 seconds Redwood No.1) at 37.8°C (100°F). The other oil should be a light distillate fuel having a relative density of about 0.83 at 15°C.

3.10 The tests should be carried out with clean water having a relative density at 15°C not more than 0.085 greater than the relative density of the heavier fuel oil detailed in 3.9.

3.11 The equipment should be presented with an influent mixture containing not less than 3,000 ppm for a period equal to two times the residence time prior to any performance measurements being taken.

3.12 The equipment should be fed with a mixture containing not less than 3,000 ppm of the heavier oil for a minimum period of three hours; at least three samples should be taken at intervals not exceeding one hour, but the test should be of such duration that the operation of the devices mentioned in 3.16 is proved to be satisfactory.

3.13 The test detailed in 3.12 should be repeated with the lighter oil and samples should be taken at the intervals specified in 3.12.

3.14 The tests should be carried out consecutively and work (e.g. changing filter elements or pads) should not be permitted during the test period.

3.15 The oil content of the samples should be determined by the method described in Part IV of the Annex to resolution A.393(X).

3.16 If devices such as oil floats or oil level indicators are fitted these should be in operation during the tests and their satisfactory operation reported.

4 Certification

4.1 After satisfactory completion of tests the Administration should issue a certificate of type test as attached to these specifications.

5 Installation

5.1 The installation should be carried out in accordance with the manufacturer's drawings and instructions.

5.2 The equipment should be permanently attached to the oily-water separator by means of steel pipes, or equivalent, and any changes in cross-sectional area in the pipework should be gradual.

5.3 Bends and fittings in the connecting pipework should be kept to a minimum and so arranged as to keep the flow characteristics constant so far as is practicable.

5.4 The equipment should be positioned, so far as is practicable, in the same horizontal plane as the separator to which it is attached.

5.5 Positive means should be provided to minimize oil spillage when it is necessary to renew elements or clean internal sections.

5.6 For future inspection purposes aboard ship a sampling point should be provided in a vertical section of the water effluent piping as close as practicable to the equipment outlet.



ATTACHMENT TO THE SPECIFICATIONS FOR PROCESS UNITS
INTENDED FOR ATTACHMENT TO EXISTING
OILY-WATER SEPARATING EQUIPMENT

Name of Administration

**CERTIFICATE OF TYPE TEST FOR PROCESS UNITS FOR
ATTACHMENT TO EXISTING OILY-WATER SEPARATING EQUIPMENT**

This is to certify that the equipment listed has been examined and tested in accordance with the requirements of the specifications for process units intended for attachment to existing oily-water separators contained in Appendix I to the Annex to IMCO Assembly resolution A.444(XI). The system tested comprised the following components and this certificate is valid only for such a system.

Type or model

System manufactured by including

* Coalescer manufactured by

to Drawing Nos *[Type or model]*

* Filter manufactured by

to Drawing Nos *[Type or model]*

* Control equipment manufactured by

to Drawing Nos *[Type or model]*

Maximum throughput of system m³/h

Measured oil content of effluent less than 15 ppm* 100 ppm*

A copy of this certificate should be carried at all times aboard a vessel fitted with this equipment.

Limiting conditions imposed

Test data and results attached
as appendix to this certificate

Official stamp

Signed

Administration of

Dated this day of 19....

* *Delete as appropriate.*

APPENDIX TO CERTIFICATE OF TYPE TEST

Data and results of the tests conducted on the equipment listed in accordance with the requirements of the specifications for process units intended for attachment to existing oily-water separating equipment contained in Appendix 1 to the Annex to IMCO Assembly resolution A.444(XI) and Part IV of the Annex to the Recommendation contained in IMCO Assembly Resolution A.393(X).

System manufactured by including

* Coalescer manufactured by

to Drawing Nos

* Filter manufactured by

to Drawing Nos

* Control equipment manufactured by

to Drawing Nos

Maximum throughput of the system m³/h

Test location

Method of sample analysis

Samples analysed at

Diagram of test rig attached

Diagram of sampling arrangement attached

Details of test pump

Type

Capacity m³/h

Speed r.p.m.

Oil float or oil level indicator operation

The results of the vibration tests mentioned in paragraph 2.3 of the specifications are satisfactory.

The equipment is capable of reliable operation at angles of up to 22.5° in any plane from the normal operational position.

* *Delete as appropriate*

Test oil (A)		
Relative density		at 15°C
Viscosity		Centistokes at 37.8°C
Flash point		°C
Ash content		%
Water content at start of test		%
Test oil (B)		
Relative density		at 15°C
Viscosity		Centistokes at 37.8°C
Flash point		°C
Ash content		%
Water content at start of test		%
Test water		
Relative density		at 15°C
Solid matter present		
Test temperatures		
Ambient		°C
Test oil (A)		°C
Test oil (B)		°C
Test water		°C

TEST RESULTS (ppm)

Test oil (A)		Test oil (B)		Vm — maximum throughput of equipment	Ve — volume of equipment	not less than $\frac{2 V_e}{V_m}$	Conditioning
Influent	Effluent	Influent	Effluent				
.....	①	①	1	Efficiency test more than 3000 ppm
.....	②	②	1	
.....	③	③	1	

TIME (hours) ↓

Signed Date Official Stamp

APPENDIX 2

RECOMMENDATION CONCERNING OILY-WATER SEPARATING EQUIPMENT
UNDER THE 1969 AMENDMENTS TO THE
INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION
OF THE SEA BY OIL, 1954

(Adopted by the Marine Environment Protection Committee
at its eighth session and circulated under cover of
MEPC/Circ.56 of 30 December 1977)

This Recommendation is for use by Administrations in establishing national programmes for dealing with oily-water separating equipment under the terms of the 1969 amendments to the International Convention for the Prevention of Pollution of the Sea by Oil, 1954. It is intended to be applied to ships covered by the 1969 amendments, that is, ships other than oil tankers of 500 tons gross tonnage and above and oil tankers of 150 tons gross tonnage and above.

I. Existing non-approved oily-water separating equipment

It is recommended that as soon as possible and in any case not later than 20 January 1979, such equipment either:

- (a) be replaced with a separator having type approval under the terms of resolution A.393(X),* or
- (b) be fitted with an oil content meter of a type approved under resolution A.393(X).

II. Existing nationally approved oily-water separating equipment

It is recommended that existing oily-water separating equipment that has been approved to an existing national standard for an effluent of less than 100 parts per million be accepted, provided that:

- (a) the physical condition and the arrangement of the system continue to be to the satisfaction of the Administration;
- (b) the throughput of the system must not exceed the approved throughput of the separator and the supply pump must have emulsifying characteristics no worse than those of the pump used for approval;
- (c) the arrangements on each ship for minimizing the entry of oil to the bilges are to the satisfaction of the Administration; and
- (d) each ship fitted with a system accepted by the Administration carries at all times a certificate issued by, or on behalf of, the Administration, stating that points (a), (b) and (c) are satisfactory.

III. Existing oily-water separating equipment approved under resolution A.233(VII)

It is recommended that such equipment be accepted provided that the physical condition and the arrangement of the system is to the satisfaction of the Administration.

IV. Ships with no installed oily-water separating equipment

It is recommended that such ships be required to install an approved oily-water separator as soon as possible, and in any case not later than 20 January 1979. Such equipment should be of a type approved under resolution A.393(X). In special cases, equivalent existing arrangements approved by an Administration under national regulations as complying with the discharge requirements of the 1969 amendments should be accepted. A certificate to this effect issued by, or on behalf of, the Administration should be aboard the ship at all times.

* Existing oily-water separators may remain on board if their prototype was tested and approved under resolution A.393(X) not later than 20 January 1979.