

LEGISLATIVE COUNCIL BRIEF

Merchant Shipping (Prevention and Control of Pollution) Ordinance

(Cap. 413)

Merchant Shipping (Prevention of Pollution by Sewage) (Amendment) Regulation 2015

INTRODUCTION

A The Secretary for Transport and Housing will make the Merchant Shipping (Prevention of Pollution by Sewage) (Amendment) Regulation 2015 (“the Amendment Regulation”), at **Annex A**, under section 3 of the Merchant Shipping (Prevention and Control of Pollution) Ordinance (Cap. 413) (“the Ordinance”) to update the relevant local legislation to align with the latest international requirements governing discharge of sewage from ships as prescribed by the International Maritime Organization (“IMO”).

JUSTIFICATIONS

IMO Requirements

2. In 1973, the IMO adopted the “International Convention for the Prevention of Pollution from Ships” (now universally known as MARPOL), which has been amended by the Protocols of 1978 and 1997, to stipulate regulations aimed at preventing and minimising pollution from ships. MARPOL contains six technical Annexes to address different forms of pollution from ships. The MAPROL Annexes are implemented in Hong Kong by way of subsidiary legislation made under the Ordinance.

3. MARPOL Annex IV - “Regulations for the Prevention of Pollution by Sewage From Ships”, which entered into force in 2003, is implemented in Hong Kong through the Merchant Shipping (Prevention of Pollution by Sewage) Regulation (Cap. 413K) (“the Regulation”).

Existing Requirements under the Regulation

4. The Regulation governs the discharge of sewage from ships which are engaged in international voyage with a gross tonnage (“GT”) of 400 and above, or less than 400 GT but are certified to carry more than 15 persons. The Regulation applies to ships within Hong Kong waters as well as Hong Kong ships wherever they are. Under the Regulation, ocean-going vessels (“OGVs”) of the above categories are subject to periodic survey and are required to carry on board an International Sewage Pollution Prevention Certificate (“ISPP Certificate”)¹ issued by the Flag State or its recognised organisations² as a proof that the ships’ structure, equipment, systems, fittings, etc. are in conformity with the requirements of MARPOL Annex IV. The Regulation also prohibits discharge of sewage from ships unless –

- (a) the ship is equipped with a sewage treatment plant that is in compliance with the effluent standards adopted by the IMO;
- (b) the ship is discharging comminuted and disinfected sewage using an approved system at a distance of more than 3 nautical miles from the nearest land³ while the ship is proceeding en route at not less than 4 knots ; or
- (c) for sewage that is not comminuted or disinfected, it is discharged at a distance of more than 12 nautical miles from the nearest land while the ship is proceeding en route at not less than 4 knots.

¹ An ISPP Certificate issued as a result of an initial survey or renewal survey is valid for a period of not exceeding five years from the date of completion of survey.

² Recognised Organisations are international bodies specialised in the technical areas of ships, such as ship construction, equipment, operation and surveys, etc. At present, the Marine Department entrusted Recognised Organisations through contractual agreements to carry out certain services, such as to survey ships and to issue certificates for these ships, etc.

³ Nearest land means, in general, the baseline from which the territorial sea of the territory in question is established in accordance with the international law. On this basis, for China, its nearest land is beyond Hong Kong waters.

In all the three scenarios above, the effluent discharged must not produce visible floating solids nor cause discoloration of the surrounding water.

Legislative Proposals

5. In view of the revisions made to MARPOL Annex IV over the years, we need to amend the Regulation to incorporate the changes and align our legislation with the latest international requirements. The key changes made are set out in the ensuing paragraphs.

(I) Major Amendments

(i) *Higher effluent standards of sewage treatment plant*

6. MARPOL Annex IV has stipulated the effluent standards required of sewage treatment plant installed on ships. The effluent standards are expressed in terms of the permitted levels of specified substances in the effluent including faecal coliform, total suspended solids, biochemical oxygen demand, pH, total nitrogen and total phosphorus. At present, the Regulation requires sewage treatment plant installed on OGVs to comply with effluent standards adopted by the IMO on 3 December 1976 through Resolution MEPC.2(VI). With technological advancement, the IMO has raised the standards over the years such that the standards in MEPC.2(VI) are now only applicable to sewage treatment plant installed on ships prior to 1 January 2010. The IMO has further enhanced effluent standards⁴ for sewage treatment plant installed in later periods through Resolution MEPC.159(55), which is applicable to installations on or after 1 January 2010 and prior to 1 January 2016, and Resolution MEPC.227(64), which is applicable to installations on or after 1 January 2016. Therefore, from 1 January 2016, three different standards will be applicable according to the plant installation date. The Amendment Regulation will require OGVs to comply with the applicable effluent standards adopted by the IMO for sewage treatment plants.

⁴ Higher effluent standards mean that lower levels of specified substances are permitted in the effluent.

(ii) *Introduction of sewage discharge rate*

7. The Amendment Regulation will tighten control by requiring discharges referred to in paragraphs 4(b) and 4(c) which are from holding tanks or spaces containing living animals be made at a moderate rate as derived from a formula adopted by the IMO.

(iii) *Power of the Director to issue ISPP Certificate at the request of Convention Countries*

8. At present, the Director of Marine (“the Director”) may only issue an ISPP Certificate to a Hong Kong ship or endorse its existing ISPP Certificate after satisfactory completion of a survey. To fulfil our obligation under MARPOL Annex IV, the Amendment Regulation will empower the Director to conduct survey, issue an ISPP Certificate or endorse on an existing ISPP Certificate in respect of a non-Hong Kong ship which is within the waters of Hong Kong at the request of any Convention country.

(iv) *Clear specification of Government surveyors’ powers*

9. Apart from the proposed amendments in items (i) to (iii) above which are to align with the latest requirements of MARPOL Annex IV, we propose to specify clearly in the Regulation the powers of Government surveyors to conduct inspection, examination and investigation of ships for the purpose of ascertaining whether the Regulation has been complied with. These enforcement powers are in line with those provided in other marine legislation. If a deficiency is identified upon inspection of a ship by a Government surveyor, the Director may give a direction to the master of the ship requiring the ship not to proceed to sea until the deficiency has been rectified. If the deficiency of a Hong Kong ship is not rectified within a specified period, the Director may withdraw its ISPP Certificate.

(II) **Application of direct reference approach**

10. Section 3A of the Ordinance allows for the application of “direct reference approach” (“DRA”) in its regulations for the purpose of giving

effect to provisions of international agreements applicable to Hong Kong. DRA means making direct reference to provisions under international agreements in local legislation so as to apply those provisions locally. DRA enables timely implementation of international requirements that are technical in nature and are commonly applied in other jurisdictions across the world. If Hong Kong ships cannot comply with those requirements, they may be denied entry to other ports. However, DRA may not be appropriate for implementing all requirements under international agreements. When adopting this approach, various factors must be taken into account, including:

- (a) whether the requirements in provisions of the international agreement are clear and specific enough to be capable of being given direct effect;
- (b) whether the international agreement provisions are easily accessible and read to facilitate understanding of relevant requirements by those required to comply with these provisions;
- (c) whether the international agreement topics mainly concern a specific group of people, and whether such group of people are familiar with the requirements of the international agreement concerned;
- (d) whether relevant international requirements are applicable to all party states to the agreement and whether adoption of DRA is conducive to achieving uniformity in the implementation of the relevant requirements; and
- (e) whether the terminology of the international agreement provisions is compatible with local legislation.

11. DRA was adopted in certain provisions of the Regulation. After a careful review of the provisions of the proposed amendments against the above factors, we have identified a number of provisions that are suitable for the application of DRA. These provisions are set out at **Annex B**.

The Amendment Regulation

12. The main provisions of the Amendment Regulation are set out below –

- (a) Section 7 adds a new section 6A to the Regulation which empowers the Director to issue and endorse on an ISPP Certificate at the request of a Convention country;
- (b) Section 23 amends section 28 of the Regulation to update the restrictions on discharge of sewage into sea in accordance with MARPOL Annex IV;
- (c) Section 24 adds a new section 29A under the new Part 5A to the Regulation to provide Government surveyors with general powers to inspect and examine ships. Section 25 adds a new section 29B to the Regulation to deal with the obstruction of, and non-compliance with the requirements imposed by Government surveyors in their exercising the power under the new section 29A; and
- (d) Section 27 amends the Schedule to the Regulation to update the requirements for equipment in accordance with MARPOL Annex IV.

LEGISLATIVE TIMETABLE

13. The Amendment Regulation will be published in the Gazette on 5 June 2015 and introduced into the Legislative Council (“LegCo”) on 10 June 2015. It will come into operation on 1 November 2015, after expiry of the negative vetting period.

IMPLICATIONS OF THE PROPOSAL

14. The implementation of the latest requirements of MARPOL Annex IV in Hong Kong will contribute to environmental protection and sustainability of the marine environment. The legislative proposal is in conformity with the Basic Law, including provisions concerning human rights. It will not affect the current binding effect of the Ordinance. The proposal has no financial, economic, productivity, civil service or family implications.

PUBLIC CONSULTATION

15. On 16 December 2014, we consulted the LegCo Panel on Economic Development on the legislative proposal. Members endorsed the proposal. The Shipping Consultative Committee was also consulted and it raised no objection to the proposal.

PUBLICITY

16. A press release will be issued on 5 June 2015. A spokesperson will be available to handle enquires.

ENQUIRIES

17. Any enquiries on this brief can be addressed to Mr. Y.K. Lai, Chief, Maritime Policy of Marine Department (Tel: 2852 4603) or Miss Joyce Chan, Assistant Secretary for Transport and Housing (Transport) (Tel: 3509 8257).

***Transport and Housing Bureau
3 June 2015***

Merchant Shipping (Prevention of Pollution by Sewage) (Amendment) Regulation 2015

Contents

Section	Page
1. Commencement.....	1
2. Merchant Shipping (Prevention of Pollution by Sewage) Regulation amended	1
3. Section 2 amended (interpretation).....	1
4. Section 3 amended (application and exemption)	3
5. Section 5 amended (Director may recognize organizations to survey ships and issue and endorse certificates).....	3
6. Section 6 amended (Director may request Convention countries to survey ships and issue or endorse certificates).....	4
7. Section 6A added.....	4
6A. Director may issue sewage certificates etc. at request of Convention countries	5
8. Section 9 amended (applications for issue of International Sewage Pollution Prevention Certificates)	5
9. Section 10 amended (initial surveys and renewal surveys)	5
10. Section 11 amended (form of sewage certificates)	6
11. Section 13 amended (extension of period of validity).....	6

Section	Page
12. Section 15 amended (extension of period of validity where ships are not in ports in which ships are to be surveyed).....	6
13. Section 16 amended (extension of period of validity where ships are on short voyages).....	6
14. Section 19 amended (certified true copies of sewage certificates)	7
15. Section 20 amended (alteration made to sewage certificates)	7
16. Part 4 heading substituted	7

Part 4

Duties of Owners and Masters and Additional Surveys, etc.

17. Section 21 amended (interpretation of Part 4)	8
18. Section 24 amended (duty to report defects of ships, etc.)	8
19. Section 25 repealed (actions against ships that are not fit to proceed to sea without presenting unreasonable threat of harm to marine environment, etc.).....	8
20. Section 26 amended (additional surveys)	9
21. Section 26A added.....	9
26A. Corrective action to be taken	9
22. Section 27 amended (cancellation of ISPP Certificates).....	10
23. Section 28 amended (restriction on discharge of sewage into sea).....	11

Section	Page
24.	Part 5A added 12
Part 5A	
Power of Government Surveyors	
29A.	Power of Government surveyors to inspect, examine, etc. ships..... 13
25.	Section 29B added 16
29B.	Obstruction and non-compliance with requirements 16
26.	Section 30 amended (offences and penalties)..... 16
27.	Schedule amended (requirements for equipments, etc.) 18

Merchant Shipping (Prevention of Pollution by Sewage) (Amendment) Regulation 2015

(Made by the Secretary for Transport and Housing under section 3 of the Merchant Shipping (Prevention and Control of Pollution) Ordinance (Cap. 413))

1. Commencement

This Regulation comes into operation on 1 November 2015.

2. Merchant Shipping (Prevention of Pollution by Sewage) Regulation amended

The Merchant Shipping (Prevention of Pollution by Sewage) Regulation (Cap. 413 sub. leg. K) is amended as set out in sections 3 to 27.

3. Section 2 amended (interpretation)

(1) Section 2, definition of *Convention*—

Repeal

everything after “1973,”

Substitute

“including its protocols and appendices, and Annex IV (but no other Annex), as from time to time revised or amended by any revision or amendment to any provision of such Convention that applies to Hong Kong;”.

(2) Section 2, definition of *international voyage*—

Repeal

everything after “a voyage”

Substitute

“between—

- (a) Hong Kong and a port outside the People’s Republic of China; or
 - (b) a port in a Convention country and a port outside that country (whether in another Convention country or not);”.
- (3) Section 2, definition of *ISPP Certificate*—

Repeal

everything after “means—”

Substitute

- “(a) a sewage certificate;
 - (b) a certificate entitled “International Sewage Pollution Prevention Certificate” issued by a recognized organization in conformity with Annex IV to the Convention; or
 - (c) a certificate issued by or under the authority of an Administration in conformity with Annex IV to the Convention;”.
- (4) Section 2, English text, definition of *sewage certificate*—
- Repeal the semicolon**
- Substitute a full stop.**
- (5) Section 2, Chinese text, definition of *續證檢驗*—
- Repeal the semicolon**
- Substitute a full stop.**
- (6) Section 2—
- Repeal the definitions of *Annex IV*, *company* and *surveyor*.**
- (7) Section 2—

Add in alphabetical order

“*Administration* (主管機關), in relation to a ship, means the government of any place outside Hong Kong whose flag the ship is entitled to fly;

Annex IV (《附則 IV》) means the revised Annex IV to the Convention adopted by the International Maritime Organization by resolution MEPC.115(51), as from time to time revised or amended by the revision or amendment that applies to Hong Kong;”.

4. Section 3 amended (application and exemption)

- (1) Section 3(1)—

Repeal

“(2),”.

- (2) Section 3—

Repeal subsection (2).

- (3) Section 3—

Repeal subsection (5).

5. Section 5 amended (Director may recognize organizations to survey ships and issue and endorse certificates)

- (1) Section 5(1)(a), after “Convention”—

Add

“and specifying any corrective actions which the organization considers necessary to be taken in respect of those ships”.

- (2) Section 5, Chinese text—

Repeal

“附件 IV” (wherever appearing)

Substitute

“《附則 IV》”。

- (3) Section 5, Chinese text—

Repeal

“該附件” (wherever appearing)

Substitute

“該附則”。

6. Section 6 amended (Director may request Convention countries to survey ships and issue or endorse certificates)

- (1) Section 6, Chinese text—

Repeal

“附件 IV” (wherever appearing)

Substitute

“《附則 IV》”。

- (2) Section 6, Chinese text—

Repeal

“該附件”

Substitute

“該附則”。

7. Section 6A added

After section 6—

Add

“6A. Director may issue sewage certificates etc. at request of Convention countries

- (1) The Director may, at the request of any Convention country—

(a) cause a non-Hong Kong ship that is within the waters of Hong Kong to be surveyed under sections 9 and 10 as if the ship were a Hong Kong ship;

(b) issue a sewage certificate in respect of the ship under section 9 as if the ship were a Hong Kong ship; and

(c) endorse on an ISPP Certificate in conformity with Annex IV to the Convention.

- (2) For the purpose of subsection (1), sections 9 and 10 apply as if a reference in those sections to the Schedule were a reference to Annex IV to the Convention.”

8. Section 9 amended (applications for issue of International Sewage Pollution Prevention Certificates)

Section 9(1)—

Repeal

“A company”

Substitute

“An owner”。

9. Section 10 amended (initial surveys and renewal surveys)

- (1) Section 10(1), before “surveyor”—

Add

“Government”。

- (2) Section 10(4), before “surveyor”—

Add

“Government”.

10. Section 11 amended (form of sewage certificates)

Section 11(2), Chinese text—

Repeal

“附件 IV”

Substitute

“《附則 IV》”.

11. Section 13 amended (extension of period of validity)

Section 13(1)—

Repeal

“company”

Substitute

“owner”.

12. Section 15 amended (extension of period of validity where ships are not in ports in which ships are to be surveyed)

Section 15(1)—

Repeal

“company”

Substitute

“owner”.

13. Section 16 amended (extension of period of validity where ships are on short voyages)

Section 16—

Repeal

“company”

Substitute

“owner”.

14. Section 19 amended (certified true copies of sewage certificates)

Section 19—

Repeal

“company”

Substitute

“owner”.

15. Section 20 amended (alteration made to sewage certificates)

Section 20(1)—

Repeal

“company”

Substitute

“owner”.

16. Part 4 heading substituted

Part 4, heading—

Repeal the heading

Substitute

“Part 4

**Duties of Owners and Masters and Additional
Surveys, etc.”.**

17. Section 21 amended (interpretation of Part 4)

(1) Section 21(c)(ii)—

Repeal

“that are equivalent to the provisions of the Schedule”.

(2) Section 21(c)(ii), Chinese text—

Repeal

“附件 IV”

Substitute

“《附則 IV》”.

18. Section 24 amended (duty to report defects of ships, etc.)

Section 24(1)—

Repeal

“company”

Substitute

“owner”.

**19. Section 25 repealed (actions against ships that are not fit to
proceed to sea without presenting unreasonable threat of harm
to marine environment, etc.)**

Section 25—

Repeal the section.

20. Section 26 amended (additional surveys)

(1) Section 26(1)—

Repeal paragraph (a).

(2) Section 26(1), before “surveyor”—

Add

“Government”.

(3) Section 26(2)—

Repeal

“company”

Substitute

“owner”.

(4) Section 26(3), before “surveyor”—

Add

“Government”.

21. Section 26A added

After section 26—

Add

“26A. Corrective action to be taken

(1) A Government surveyor may, by written notice, require the owner or the master of a Hong Kong ship in respect of which an ISPP Certificate has been issued to take such corrective action which the surveyor considers necessary if on any survey (other than an initial survey) of the ship—

(a) the surveyor determines that the condition of the ship, or its equipment, does not correspond

substantially with the particulars in the Certificate;
or

- (b) the surveyor is of the opinion that the ship is not fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment.
- (2) A surveyor must, on giving notice under subsection (1), inform the Director.
- (3) If the corrective action is not taken within the period specified by the surveyor, the surveyor must inform the Director and the Director may, by written notice to the owner and the master of the ship, withdraw the Certificate.
- (4) On receiving a notice under subsection (3), the owner and the master of the ship must deliver the Certificate to the Director immediately.
- (5) The owner or the master of the ship may, after the corrective action in respect of the ship has been taken, apply to the Director for the return of the Certificate.
- (6) On receiving an application under subsection (5), if the Director is satisfied that the corrective action in respect of the ship has been taken, the Director must, by written notice to the owner or the master, return the Certificate to the owner or the master.”.

22. Section 27 amended (cancellation of ISPP Certificates)

- (1) Section 27(1)—
Repeal
“company”
Substitute

“owner and the master”.

- (2) Section 27(3)—

Repeal

“company”

Substitute

“owner and the master”.

23. Section 28 amended (restriction on discharge of sewage into sea)

- (1) Section 28(1)(a)(i)—

Repeal

“or a sewage comminuting and disinfecting system specified in the ISPP Certificate issued in respect of the ship,”.

- (2) Section 28(1)(a)(ii)—

Repeal

everything after “sewage”

Substitute

“originating from spaces containing living animals or that has been stored in holding tanks is not discharged instantaneously but at a moderate rate; and”.

- (3) Section 28(1)(a)—

Repeal subparagraph (iii).

- (4) Section 28(1)(b)(ii)—

Repeal

everything after “sewage”

Substitute

“originating from spaces containing living animals or that has been stored in holding tanks is not discharged instantaneously but at a moderate rate; and”.

- (5) Section 28(1)(b)—

Repeal subparagraph (iii).

- (6) Section 28(1)(c)—

Repeal

“or a sewage treatment plant specified in the ISPP Certificate issued in respect of the ship”.

- (7) Section 28(1)(c)—

Repeal subparagraph (i).

- (8) After section 28(2)—

Add

“(3) In this section—

moderate rate (適當的速率) means the rate which is derived in accordance with the recommendation on standards for discharge of sewage from ships adopted by the International Maritime Organization.”.

24. Part 5A added

After Part 5—

Add

“Part 5A

Power of Government Surveyors

29A. Power of Government surveyors to inspect, examine, etc. ships

- (1) Any of the powers conferred by this section may be exercised for the purpose of ascertaining whether this Regulation has been or is being complied with.
- (2) A Government surveyor may, at any reasonable time—
 - (a) board a ship that is within the waters of Hong Kong; and
 - (b) take with the surveyor any other person and any equipment or materials required to assist the surveyor.
- (3) After boarding the ship, the Government surveyor may—
 - (a) inspect the ship;
 - (b) make any examination and investigation as the surveyor considers necessary;
 - (c) take samples of any article or substance found on the ship that the surveyor may reasonably require for the inspection, examination or investigation;
 - (d) inspect, seize and remove from the ship any article or substance in respect of which the surveyor suspects on reasonable grounds that an offence under this Regulation has been committed;
 - (e) detain the article or substance for so long as is necessary—

- (i) for the inspection, examination or investigation; and
- (ii) to ensure that it is available for use as evidence in any proceedings for an offence under this Regulation;
- (f) take any measurements and photographs and make any recordings that the surveyor may reasonably require for the inspection, examination or investigation;
- (g) require that the ship or any part of it, or anything on the ship, is to be left undisturbed (whether generally or in particular respects) for so long as is necessary for the inspection, examination or investigation;
- (h) require any person who the surveyor reasonably believes is able to give any information relevant to the inspection, examination or investigation—
 - (i) to attend at a place and time specified by the surveyor;
 - (ii) to answer the questions that the surveyor thinks fit to ask; and
 - (iii) to sign a declaration of the truth of the person's answers;
- (i) require the production of, and inspect and take copies of or of any entry in—
 - (i) any certificates, books or documents that are required to be kept under this Regulation; and
 - (ii) any other certificates, books or documents that the surveyor considers necessary for the inspection, examination or investigation; and

- (j) require any person to afford the surveyor such facilities and assistance with respect to any matters or things within that person's control or in relation to which that person has responsibilities as the surveyor considers necessary to enable the surveyor to exercise any power conferred by this section.
- (4) If an inspection of a ship under subsection (3) reveals a deficiency, the Director may give a direction to the master of the ship requiring the master to cause the ship not to proceed to sea until the deficiency is rectified.
- (5) A master to whom a direction is given under subsection (4) must—
 - (a) comply with the direction;
 - (b) take steps to rectify the deficiency; and
 - (c) inform the Director once the deficiency is rectified.
- (6) If the ship concerned is a Hong Kong ship and the deficiency is not rectified within the period specified by the Director, the Director may, by written notice to the owner and the master of the ship, withdraw the ISPP Certificate issued in respect of the ship.
- (7) On receiving a notice under subsection (6), the owner and the master of the ship must deliver the Certificate to the Director immediately.
- (8) The owner or the master of the ship may, after the deficiency in respect of the ship has been rectified, apply to the Director for the return of the Certificate.
- (9) On receiving an application under subsection (8), if the Director is satisfied that the deficiency in respect of the ship has been rectified, the Director must, by written

notice to the owner or the master, return the Certificate to the owner or the master.”.

25. Section 29B added

Part 6, before section 30—

Add

“29B. Obstruction and non-compliance with requirements

- (1) A person must not—
 - (a) wilfully obstruct a Government surveyor in the exercise of any power conferred by section 29A; or
 - (b) make a statement or sign a declaration that the person knows is false, or recklessly make a statement or sign a declaration that is false, in purported compliance with a requirement under section 29A(3)(h).
- (2) A person must comply with a requirement imposed on the person under section 29A(3).”.

26. Section 30 amended (offences and penalties)

- (1) Section 30(1)—

Repeal

“or 28(1) is contravened, the company”

Substitute

“, 26A(4), 28(1) or 29A(7) is contravened, the owner”.

- (2) Section 30(1)—

Repeal

everything after “liable”

Substitute

“to a fine at level 6.”.

- (3) Section 30—

Repeal subsection (2)

Substitute

“(2) A master of a ship who fails to comply with a direction given under section 29A(4) commits an offence and is liable to a fine at level 6.”.

- (4) After section 30(2)—

Add

“(2A) A person who contravenes section 29B(1) commits an offence and is liable to a fine at level 6.

(2B) A person who without reasonable excuse fails to comply with section 29B(2) commits an offence and is liable to a fine at level 6.”.

- (5) Section 30(3)—

Repeal

“this section”

Substitute

“subsection (1)”.

- (6) After section 30(3)—

Add

“(4) If an offence under this section is committed, or would, save for the operation of subsection (3), have been committed by the owner or the master of a ship due to the act or omission of some other person, that other person also commits the offence and may be charged with and convicted of the offence whether or not proceedings are taken against the owner or the master.”.

27. Schedule amended (requirements for equipments, etc.)

(1) The Schedule—

Repeal

“[ss. 9, 10, 21, 23, 26 & 28]”

Substitute

“[ss. 6A, 9, 10, 21, 23, 26 & 28]”.

(2) The Schedule, section 1(a)—

Repeal

everything after “with the”

Substitute

“standards adopted by the International Maritime Organization for sewage treatment plants;”.



Acting Secretary for Transport and Housing

29th May 2015

Explanatory Note

This Regulation amends the Merchant Shipping (Prevention of Pollution by Sewage) Regulation (Cap. 413 sub. leg. K) (*principal Regulation*) to implement the latest requirements of Annex IV to the International Convention for the Prevention of Pollution from Ships, 1973 (*Convention*). The Regulation also makes other minor amendments to the principal Regulation.

2. The main amendments are set out below—

- (a) section 7 adds a new section 6A to the principal Regulation which empowers the Director of Marine to issue and endorse on an International Sewage Pollution Prevention Certificate at the request of a Convention country;
- (b) section 23 amends section 28 of the principal Regulation to update the restrictions on discharge of sewage into sea in accordance with the Convention;
- (c) section 24 adds a new Part 5A to the principal Regulation to provide Government surveyors with general powers to inspect and examine ships. And section 25 adds a new section 29B to the principal Regulation to deal with the obstruction of, and non-compliance with the requirements imposed by, Government surveyors in their exercising the power under the new section 29A; and
- (d) section 27 amends the Schedule to the principal Regulation to update the requirements for equipment in accordance with the Convention.

Proposed Application of “Direct Reference Approach” in Provisions of the Amendment Regulation

Item	Subject Matters Involved	Relevant Provisions of the Amendment Regulation
1	Director may issue sewage certificates etc. at request of Convention countries	<p>Section 6A (1)(c)– “(1) The Director may, at the request of any Convention country—</p> <ul style="list-style-type: none">(a) cause a non-Hong Kong ship that is within the waters of Hong Kong to be surveyed under sections 9 or 10 as if the ship were a Hong Kong ship;(b) issue a sewage certificate in respect of the ship under section 9 as if the ship were a Hong Kong ship; and(c) endorse on an ISPP Certificate in conformity with Annex IV to the Convention.” <p><i>[Note: A copy of Annex IV to the Convention is at <u>Annex C</u>¹.]</i></p>

¹ The reference material is not an official document from the IMO but a consolidated version of the amendments to MAPROL Annex IV adopted by the IMO through Resolutions.

2	Rate of discharge of sewage into sea	<p>Section 28 – “moderate rate (適當的速率) means the rate which is derived in accordance with the recommendation on standards for discharge of sewage from ships adopted by the International Maritime Organization.”</p> <p><i>[Note: A copy of the “Recommendation on Standards for the Rate of Discharge of Untreated Sewage from Ships”, adopted by the IMO, is at <u>Annex D.</u>]</i></p>
3	Requirements for sewage treatment plant	<p>Schedule – “ 1. The ship concerned shall be equipped with- (a) a sewage treatment plant which is in compliance with the standards adopted by the International Maritime Organization for sewage treatment plants;”</p> <p><i>[Note: The IMO has over the years adopted progressively enhanced effluent standards for sewage treatment plants installed in different time periods. A copy of the relevant standards adopted by the IMO in 1976, 2006 and 2012 is at <u>Annex E.</u>]</i></p>

**ANNEX IV OF MARPOL 73/78
REGULATIONS FOR THE PREVENTION OF POLLUTION BY SEWAGE
FROM SHIPS**

**Chapter 1
General**

**Regulation 1
Definitions**

For the purposes of this Annex:

- 1 "New ship" means a ship:
 - .1 for which the building contract is placed, or in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction, on or after the date of entry into force of this Annex; or
 - .2 the delivery of which is three years or more after the date of entry into force of this Annex.
- 2 "Existing ship" means a ship which is not a new ship.
- 3 "Sewage" means:
 - .1 drainage and other wastes from any form of toilets and urinals;
 - .2 drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises;
 - .3 drainage from spaces containing living animals; or
 - .4 other waste waters when mixed with the drainages defined above.
- 4 "Holding tank" means a tank used for the collection and storage of sewage.
- 5 "Nearest Land". The term "from the nearest land" means from the baseline from which the territorial sea of the territory in question is established in accordance with international law except that, for the purposes of the present Convention "from the nearest land" off the north eastern coast of Australia shall mean from a line drawn from a point on the coast of Australia in:

latitude 11°00' S, longitude 142°08' E
to a point in latitude 10°35' S, longitude 141°55' E
thence to a point latitude 10°00' S, longitude 142°00' E
thence to a point latitude 9°10' S, longitude 143°52' E
thence to a point latitude 9°00' S, longitude 144°30' E
thence to a point latitude 10°41' S, longitude 145°00' E
thence to a point latitude 13°00' S, longitude 145°00' E
thence to a point latitude 15°00' S, longitude 146°00' E
thence to a point latitude 17°30' S, longitude 147°00' E
thence to a point latitude 21°00' S, longitude 152°55' E

thence to a point latitude 24°30' S, longitude 154°00' E
thence to a point on the coast of Australia in latitude 24°42' S, longitude 153°15'
E

6 "Special area" means a sea area where for recognized technical reasons in relation to its oceanographical and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by sewage is required.

The special areas are:

- .1 the Baltic Sea area as defined in regulation 1.11.2 of Annex I; and
- .2 any other sea area designated by the Organization in accordance with criteria and procedures for designation of special areas with respect to prevention of pollution by sewage from ships.

7 "International voyage" means a voyage from a country to which the present Convention applies to a port outside such country, or conversely.

8 "Person" means member of the crew and passengers.

9 A passenger means every person other than:

- .1 the master and the members of the crew or other persons employed or engaged in any capacity on board a ship on the business of that ship; and
- .2 a child under one year of age.

10 A passenger ship means a ship which carries more than twelve passengers.

For the application of regulation 11.3, a new passenger ship is a passenger ship:

- .1 for which the building contract is placed, or in the absence of a building contract, the keel of which is laid, or which is in a similar stage of construction, on or after 1 January 2016; or
- .2 the delivery of which is two years or more after 1 January 2016.

An existing passenger ship is a passenger ship which is not a new passenger ship.

11 "Anniversary date" means the day and the month of each year which will correspond to the date of expiry of the International Sewage Pollution Prevention Certificate.

Regulation 2 Application

1 The provisions of this Annex shall apply to the following ships engaged in international voyages:

- .1 new ships of 400 gross tonnage and above; and
- .2 new ships of less than 400 gross tonnage which are certified to carry more than 15 persons; and
- .3 existing ships of 400 gross tonnage and above, five years after the date of entry into force of this Annex; and
- .4 existing ships of less than 400 gross tonnage which are certified to carry more than 15 persons, five years after the date of entry into force of this Annex.

2 The Administration shall ensure that existing ships, according to subparagraphs 1.3 and 1.4 of this regulation, the keels of which are laid or which are of a similar stage of construction before 2 October 1983 shall be equipped, as far as practicable, to discharge sewage in accordance with the requirements of regulation 11 of the Annex.

Regulation 3 Exceptions

1 Regulation 11 of this Annex shall not apply to:

- .1 the discharge of sewage from a ship necessary for the purpose of securing the safety of a ship and those on board or saving life at sea; or
- .2 the discharge of sewage resulting from damage to a ship or its equipment if all reasonable precautions have been taken before and after the occurrence of the damage, for the purpose of preventing or minimizing the discharge.

Chapter 2 Surveys and certification

Regulation 4 Surveys

1 Every ship which, in accordance with regulation 2, is required to comply with the provisions of this Annex shall be subject to the surveys specified below:

- .1 An initial survey before the ship is put in service or before the Certificate required under regulation 5 of this Annex is issued for the first time, which shall include a complete survey of its structure, equipment, systems, fittings, arrangements and material in so far as the ship is covered by this Annex. This survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex.

- .2 A renewal survey at intervals specified by the Administration, but not exceeding five years, except where regulation 8.2, 8.5, 8.6 or 8.7 of this Annex is applicable. The renewal survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with applicable requirements of this Annex.
- .3 An additional survey either general or partial, according to the circumstances, shall be made after a repair resulting from investigations prescribed in paragraph 4 of this regulation, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory and that the ship complies in all respects with the requirements of this Annex.

2 The Administration shall establish appropriate measures for ships which are not subject to the provisions of paragraph 1 of this regulation in order to ensure that the applicable provisions of this Annex are complied with.

3 Surveys of ships as regards the enforcement of the provisions of this Annex shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

4 An Administration nominating surveyors or recognizing organizations to conduct surveys as set forth in paragraph 3 of this regulation shall, as a minimum, empower any nominated surveyor or recognized organization to:

- .1 require repairs to a ship; and
- .2 carry out surveys if requested by the appropriate authorities of a Port State.

The Administration shall notify the Organization of the specific responsibilities and conditions of the authority delegated to the nominated surveyors or recognized organizations, for circulation to Parties to the present Convention for the information of their officers.

5 When a nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the Certificate or is such that the ship is not fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment, such surveyor or organization shall immediately ensure that corrective action is taken and shall in due course notify the Administration. If such corrective action is not taken the Certificate should be withdrawn and the Administration shall be notified immediately and if the ship is in a port of another Party, the appropriate authorities of the Port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or recognized organization has notified the appropriate authorities of the Port State, the Government of the Port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this regulation. When applicable, the Government of the Port State concerned shall take such steps as will ensure that the ship shall not sail until it can proceed to sea or leave the port for the purpose of proceeding to the nearest appropriate repair yard available without presenting an unreasonable threat of harm to the marine environment.

6 In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and shall undertake to ensure the necessary arrangements to satisfy this obligation.

7 The condition of the ship and its equipment shall be maintained to conform with the provisions of the present Convention to ensure that the ship in all respects will remain fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment.

8 After any survey of the ship under paragraph 1 of this regulation has been completed, no change shall be made in the structure, equipment, systems, fittings, arrangements or material covered by the survey, without the sanction of the Administration, except the direct replacement of such equipment and fittings.

9 Whenever an accident occurs to a ship or a defect is discovered which substantially affects the integrity of the ship or the efficiency or completeness of its equipment covered by this Annex the master or owner of the ship shall report at the earliest opportunity to the Administration, the recognized organization or the nominated surveyor responsible for issuing the relevant Certificate, who shall cause investigations to be initiated to determine whether a survey as required by paragraph 1 of this regulation is necessary. If the ship is in a port of another Party, the master or owner shall also report immediately to the appropriate authorities of the Port State and the nominated surveyor or recognized organization shall ascertain that such report has been made.

Regulation 5 Issue or Endorsement of Certificate

1 An international Sewage Pollution Prevention Certificate shall be issued, after an initial or renewal survey in accordance with the provisions of regulation 4 of this Annex to any ship which is engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention. In the case of existing ships this requirement shall apply five years after the date of entry into force of this Annex.

2 Such Certificate shall be issued or endorsed either by the Administration or by any persons or organization duly authorized by it. In every case the Administration assumes full responsibility for the Certificate.

Regulation 6 Issue or Endorsement of a Certificate by another Government

1 The Government of a Party to the Convention may, at the request of the Administration, cause a ship to be surveyed and, if satisfied that the provisions of this Annex are complied with, shall issue or authorize the issue of an International Sewage Pollution Prevention Certificate to the ship, and where appropriate, endorse or authorize the endorsement of that Certificate on the ship in accordance with this Annex.

2 A copy of the Certificate and a copy of the Survey report shall be transmitted as soon as possible to the Administration requesting the survey.

3 A Certificate so issued shall contain a statement to the effect that it has been issued at the request of the Administration and it shall have the same force and receive the same recognition as the Certificate issued under regulation 5 of this Annex.

4 No International Sewage Pollution Prevention Certificate shall be issued to a ship which is entitled to fly the flag of a State, which is not a Party.

Regulation 7 Form of Certificate

The International Sewage Pollution Prevention Certificate shall be drawn up in the form corresponding to the model given in the Appendix to this Annex and shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.

Regulation 8 Duration and validity of Certificate

1 An International Sewage Pollution Prevention Certificate shall be issued for a period specified by the Administration which shall not exceed five years.

2.1 Notwithstanding the requirements of paragraph 1 of this regulation, when the renewal survey is completed within three months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of expiry of the existing Certificate.

2.2 When the renewal survey is completed after the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of expiry of the existing Certificate.

2.3 When the renewal survey is completed more than three months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding five years from the date of completion of the renewal survey.

3 If a Certificate is issued for a period of less than five years, the Administration may extend the validity of the Certificate beyond the expiry date to the maximum period specified in paragraph 1 of this regulation.

4 If a renewal survey has been completed and a new Certificate cannot be issued or placed on board the ship before the expiry date of the existing Certificate, the person or organization authorized by the Administration may endorse the existing Certificate and such a Certificate shall be accepted as valid for a further period which shall not exceed five months from the expiry date.

5 If a ship at the time when a Certificate expires is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the Certificate but this extension shall be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed and then only in cases where it appears proper and reasonable to do so. No Certificate shall be extended for a period longer than three months, and a ship to which an extension is granted shall not, on its arrival in the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port without having a new Certificate. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding five years from the date of expiry of the existing Certificate before the extension was granted.

6 A Certificate issued to a ship engaged on short voyages which has not been extended under the foregoing provisions of this regulation may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding five years from the date of expiry of the existing Certificate before the extension was granted.

7 In special circumstances, as determined by the Administration, a new Certificate need not be dated from the date of expiry of the existing Certificate as required by paragraph 2.2, 5 or 6 of this regulation. In these special circumstances, the new Certificate shall be valid to a date not exceeding five years from the date of completion of the renewal survey.

8 A Certificate issued under regulation 5 or 6 of this Annex shall cease to be valid in either of the following cases:

- .1 if the relevant surveys are not completed within the periods specified under regulation 4.1 of this Annex; or
- .2 upon transfer of the ship to the flag of another State. A new Certificate shall only be issued when the Government issuing the new Certificate is fully satisfied that the ship is in compliance with the requirements of regulations 4.7 and 4.8 of this Annex. In the case of a transfer between Parties, if requested within 3 months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the Certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports.

Chapter 3 Equipment and control of discharge

Regulation 9 Sewage Systems

1 Every ship which, in accordance with regulation 2, is required to comply with the provisions of this Annex shall be equipped with one of the following sewage systems:

- .1 a sewage treatment plant which shall be of a type approved by the Administration, taking into account the standards and test methods developed by the Organization, or
- .2 a sewage comminuting and disinfecting system approved by the Administration. Such system shall be fitted with facilities to the satisfaction of the Administration, for the temporary storage of sewage when the ship is less than 3 nautical miles from the nearest land, or
- .3 a holding tank of the capacity to the satisfaction of the Administration for the retention of all sewage, having regard to the operation of the ship, the number of persons on board and other relevant factors. The holding tank shall be constructed to the satisfaction of the Administration and shall have a means to indicate visually the amount of its contents.

2 By derogation from paragraph 1, every passenger ship which, in accordance with regulation 2, is required to comply with the provisions of this Annex, and for which regulation 11.3 applies while in a special area, shall be equipped with one of the following sewage systems:

- .1 a sewage treatment plant which shall be of a type approved by the Administration, taking into account the standards and test methods developed by the Organization, or
- .2 a holding tank of the capacity to the satisfaction of the Administration for the retention of all sewage, having regard to the operation of the ship, the number of persons on board and other relevant factors. The holding tank shall be constructed to the satisfaction of the Administration and shall have a means to indicate visually the amount of its contents.

Regulation 10 Standard Discharge Connections

1 To enable pipes of reception facilities to be connected with the ship's discharge pipeline, both lines shall be fitted with a standard discharge connection in accordance with the following table:

STANDARD DIMENSIONS OF FLANGES FOR DISCHARGE CONNECTIONS

Description	Dimension
Outside diameter	210 mm
Inner diameter	According to pipe outside diameter
Bolt circle diameter	170 mm
Slots in flange	4 holes 18 mm in diameter equidistantly placed on a bolt circle of the above diameter, slotted to the flange periphery. The slot width to be 18 mm
Flange thickness	16 mm
Bolts and nuts: quantity and diameter	4, each of 16 mm in diameter and of suitable length
The flange is designed to accept pipes up to a maximum internal diameter of 100 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a suitable gasket, shall be suitable for a service pressure of 600 kPa.	

For ships having a moulded depth of 5 metres and less, the inner diameter of the discharge connection may be 38 millimetres.

2 For ships in dedicated trades, i.e. passenger ferries, alternatively the ship's discharge pipeline may be fitted with a discharge connection which can be accepted by the Administration, such as quick connection couplings.

**Regulation 11
Discharge of Sewage**

A Discharge of sewage from ships other than passenger ships in all areas and discharge of sewage from passenger ships outside special areas

1 Subject to the provisions of regulation 3 of this Annex, the discharge of sewage into the sea is prohibited, except when:

- .1 the ship is discharging comminuted and disinfected sewage using a system approved by the Administration in accordance with regulation 9.1.2 of this Annex at a distance of more than 3 nautical miles from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land, provided that, in any case, the sewage that has been stored in holding tanks, or sewage originating from spaces containing living animals, shall not be discharged instantaneously but at a moderate rate when the ship is en route and proceeding at not less than 4 knots; the rate of discharge shall be approved by the Administration based upon standards developed by the Organization³; or
- .2 the ship has in operation an approved sewage treatment plant which has been certified by the Administration to meet the operational requirements referred

to in regulation 9.1.1 of this Annex, and the effluent shall not produce visible floating solids nor cause discoloration of the surrounding water.

2 The provisions of paragraph 1 shall not apply to ships operating in the waters under the jurisdiction of a State and visiting ships from other States while they are in these waters and are discharging sewage in accordance with such less stringent requirements as may be imposed by such State.

B Discharge of sewage from passenger ships within a special area

3 Subject to the provisions of regulation 3 of this Annex, the discharge of sewage from a passenger ship within a special area shall be prohibited:

- a) for new passenger ships on, or after 1 January 2016, subject to paragraph 2 of regulation 13; and
- b) for existing passenger ships on, or after 1 January 2018, subject to paragraph 2 of regulation 13,

except when the following conditions are satisfied:

the ship has in operation an approved sewage treatment plant which has been certified by the Administration to meet the operational requirements referred to in regulation 9.2.1 of this Annex, and the effluent shall not produce visible floating solids nor cause discoloration of the surrounding water.

C General requirements

4 When the sewage is mixed with wastes or waste water covered by other Annexes of MARPOL, the requirements of those Annexes shall be complied with in addition to the requirements of this Annex.

Chapter 4 Reception facilities

Regulation 12 Reception facilities

1 The Government of each Party to the Convention, which requires ships operating in waters under its jurisdiction and visiting ships while in its waters to comply with the requirements of regulation 11.1, undertakes to ensure the provision of facilities at ports and terminals of the reception of sewage, without causing delay to ships, adequate to meet the needs of the ships using them.

2 Small Island Developing States may satisfy the requirements in paragraph 1 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the arrangement shall consult with the Organization for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

3 The Government of each Party shall notify the Organization for transmission to the Contracting Governments concerned of all cases where the facilities provided under this regulation are alleged to be inadequate.

Regulation 13

Reception facilities for passenger ships in Special Areas

.1 Each Party, the coastline of which borders a special area, undertakes to ensure that:

- .1 facilities for the reception of sewage are provided in ports and terminals which are in a special area and which are used by passenger ships;
- .2 the facilities are adequate to meet the needs of those passenger ships; and
- .3 the facilities are operated so as not to cause undue delay to those passenger ships.

.2 The Government of each Party concerned shall notify the Organization of the measures taken pursuant to paragraph 1 of this regulation. Upon receipt of sufficient notifications in accordance with paragraph 1 the Organization shall establish a date from which the requirements of regulation 11.3 in respect of the area in question shall take effect. The Organization shall notify all Parties of the date so established no less than twelve months in advance of that date. Until the date so established, ships while navigating in the special area shall comply with the requirements of regulation 11.1 of this Annex.

Chapter 5

Port State Control

Regulation 14

Port State control on operational requirements

1. A ship when in a port or an offshore terminal of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by sewage.

2. In the circumstances given in paragraph (1) of this regulation, the Party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this Annex.

3. Procedures relating to the port State control prescribed in article 5 of the present Convention shall apply to this regulation.

4. Nothing in this regulation shall be construed to limit the rights and obligations of a Party carrying out control over operational requirements specifically provided for in the present Convention.

Appendix

FORM OF CERTIFICATE

International Sewage Pollution Prevention Certificate

Issued under the provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and as amended by resolution MEPC...(...), (hereinafter referred to as "the Convention") under the authority of the Government of:

.....

(full designation of the country)

by

(full designation of the competent person or organization authorized under the provisions of the Convention)

Particulars of ship¹

Type of ship for the application of regulation 11.3:*

New/Existing passenger ship

Ship other than a passenger ship

Name of ship

Distinctive number or letters

Port of registry

Gross tonnage

Number of persons which the ship is certified to carry

IMO Number²

New/existing ship*

Date on which keel was laid or ship was at a similar stage of construction or, where applicable, date on which work for a conversion or an alteration or modification of a major character was commenced.....

¹ Alternatively, the particulars of the ship may be placed horizontally in boxes.

² Refer to the IMO Ship Identification Number Scheme adopted by the Organization by resolution A.600(15).

* Delete as appropriate

THIS IS TO CERTIFY

1 That the ship is equipped with a sewage treatment plant/comminuter/holding tank* and a discharge pipeline in compliance with regulations 9 and 10 of Annex IV of the Convention as follows:

*1.1 Description of the sewage treatment plant:

Type of sewage treatment plant.....

Name of manufacturer.....

The sewage treatment plant is certified by the Administration to meet the effluent standards as provided for in resolution MEPC.2(VI).

The sewage treatment plant is certified by the Administration to meet the effluent standards as provided for in resolution MEPC.159(55).

The sewage treatment plant is certified by the Administration to meet the effluent standards as provided for in [resolution MEPC....]. §

*1.2 Description of comminuter:

Type of comminuter.....

Name of comminuter.....

Standard of sewage after disinfection.....

*1.3 Description of holding tank:

Total capacity of the holding tankm³

Location.....

1.4 A pipeline for the discharge of sewage to a reception facility, fitted with a standard shore connection.

2 The ship has been surveyed in accordance with regulation 4 of Annex IV of the Convention.

3 That the survey shows that the structure, equipment, systems, fittings, arrangements and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex IV of the Convention.

This Certificate is valid until

.....³
subject to surveys in accordance with regulation 4 of Annex IV of the Convention.

Completion date of survey on which this Certificate is based:

.....dd/mm/yyyy

Issued at.....
(Place of issue of Certificate)

.....
(Date of issue)

.....
(Signature of authorized official issuing the Certificate)

(Seal or stamp of the authority, as appropriate)

³ Insert the date of expiry as specified by the Administration in accordance with regulation 8.1 of Annex IV of the Convention. The day and the month of this date correspond to the anniversary date as defined in regulation 1.8 of Annex IV of the Convention.

§ The number of the MEPC resolution will be inserted when the standards have been adopted by the MEPC at a future session.

* Delete as appropriate

Endorsement to extend the Certificate if valid for less than 5 years where regulation 8.3. applies

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 8.3 of Annex IV of the Convention, be accepted as valid until.....

Signed:
(signature of authorized official)

Place:

Date:

(Seal or stamp of the authority, as appropriate)

Endorsement where the renewal survey has been completed and regulation 8.4 applies

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with regulation 8.4 of Annex IV of the Convention, be accepted as valid until.....

Signed:
(signature of authorized official)

Place:

Date:

(Seal or stamp of the authority, as appropriate)

Endorsement to extend the validity of the Certificate until reaching the port of survey
or for a period of grace where regulation 8.5 or 8.6 applies

This certificate shall, in accordance with regulation 8.5 or 8.6* of Annex IV of the
Convention, be accepted as valid
until

Signed:
(signature of authorized official)

Place:

Date:

(Seal or stamp of the authority, as appropriate)

* Delete as appropriate

ANNEX 14**RESOLUTION MEPC.157(55)
Adopted on 13 October 2006****RECOMMENDATION ON STANDARDS FOR THE RATE OF DISCHARGE
OF UNTREATED SEWAGE FROM SHIPS**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution,

NOTING resolution MEPC.115(51) by which the Committee adopted the revised MARPOL Annex IV, which entered into force on 1 August 2005,

NOTING ALSO the provisions of regulation 11.1.1 of MARPOL Annex IV,

RECOGNIZING that untreated sewage that has been stored in holding tanks shall not be discharged instantaneously but that the discharge is to be undertaken at a moderate rate approved by the Administration based upon the standards developed by the Organization,

HAVING CONSIDERED the recommendations made by the Sub-Committee on Bulk Liquids and Gases at its tenth session,

1. ADOPTS the Recommendation on standards for the rate of discharge of untreated sewage from ships, the text of which is set out in the Annex to the present resolution;
2. RECOMMENDS member Governments to accept the rate of discharge based upon the annexed Standards,
3. ENCOURAGES operators of ships that may have high discharge requirements to keep calculations of actual discharges to demonstrate compliance to the Administration and to port or coastal State authorities.

ANNEX

RECOMMENDATION ON STANDARDS FOR THE RATE OF DISCHARGE OF UNTREATED SEWAGE FROM SHIPS

1 INTRODUCTION

- 1.1 Regulation 11.1.1 of the revised Annex IV of MARPOL 73/78 requires that untreated sewage, which may be discharged at more than 12 nautical miles from the nearest land, should not be discharged instantaneously but at a moderate rate of discharge when the ship is en route and proceeding at a speed not less than 4 knots, while the rate should be approved by the Administration based upon standards developed by the Organization. This Recommendation provides the standard and guidance for the approval and calculation of a moderate rate of discharge.
- 1.2 A moderate rate of discharge applies to the discharge of untreated sewage that has been stored in holding tanks.
- 1.3 This standard does not incorporate the dilution of sewage with water or greywater into calculations of the discharge rate. Therefore the rate is a conservative estimate and it is recognised that discharges of sewage in accordance with this standard will present a higher level of protection to the marine environment due to mixing prior to the actual discharge in addition to the mixing action of the ship's wake.

2 DEFINITIONS

- 2.1 *Swept volume* means ship breadth x draft x distance travelled.
- 2.2 *Untreated sewage* means sewage that has not been treated by a type approved sewage treatment plant, or that has not been comminuted and disinfected.

3 DISCHARGE RATE

- 3.1 The maximum permissible discharge rate is 1/200,000 (or one 200,000th part) of swept volume as follows:

$$DR_{\max} = 0.00926 V D B$$

Where:

DR_{\max} is maximum permissible discharge rate (m³/h)
V is ship's average speed (knots) over the period
D is Draft (m)
B is Breadth (m)

- 3.2 The maximum permissible discharge rate specified in 3.1 refers to the average rate as calculated over any 24 hour period, or the period of discharge if that is less, and may be exceeded by no more than 20% when measured on an hourly basis.

4 APPROVAL OF RATE BY ADMINISTRATION

4.1 The Administration should approve the rate of discharge specified in 3.1 based upon the ship's maximum summer draft and maximum service speed¹. Where sewage is to be discharged at a different combination of draft and speed one or more secondary discharge rates may also be approved².

5 METHOD OF CALCULATION

5.1 The calculated swept volume of the ship is to be determined for drafts up to and including the summer draft assigned in accordance with Article 3 of International Convention on Load Lines, 1966.

5.2 Where a ship is to discharge sewage from a holding tank using a pump calibrated at a fixed rate, the pump can either be:

- calibrated at a the rate permitted at 4 knots; or
- calibrated for a specific minimum ship's speed in excess of 4 knots.

5.3 Where the intended actual discharge rate exceeds that permissible at 4 knots, the actual discharge rate may need to be reduced or the speed increased. The rate and speed is to be detailed in the approval issued by the Administration.

6 COMPLIANCE WITH THE RATE

6.1 Before undertaking a sewage discharge in accordance with this standard, the crew member responsible for sewage operations should ensure that the ship is en route, is more than 12 nautical miles from the nearest land and the navigation speed is consistent with the discharge rate that has been approved by the Administration. Ships with high discharge requirements are encouraged to keep notes of calculations of the actual discharges to demonstrate compliance with the approved rate.

¹ The attention of ship operators and personnel is drawn to the reduction in permissible rate of discharge at reduced draft and/or speed.

² Presentation may be tabular, refer to table below. For ships other than those having a high requirement for untreated sewage discharge, such as passenger ships and livestock carriers, the discharge rate criterion will generally not be exceeded at ship speed of 4 knots.

DISCHARGE RATE (m ³ /h)					
SPEED (kt)	4	6	8	10	12
DRAFT (m)					
5	4.63	6.94	9.26	11.57	13.89
6	5.56	8.33	11.11	13.89	16.67
7	6.48	9.72	12.96	16.20	19.45
8	7.41	11.11	14.82	18.52	22.22
9	8.33	12.50	16.67	20.83	25.00

MEPC VI/17

ANNEX IVRECOMMENDATION ON INTERNATIONAL EFFLUENT STANDARDS AND GUIDELINES
FOR PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS

Resolution MEPC.2(VI)
adopted on 3 December 1976

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

NOTING Resolution A.297(VIII) by which the Assembly designated the Committee as the appropriate body to perform such functions as are or may be conferred upon the Organization under international conventions for the prevention and control of pollution from ships,

NOTING FURTHER Regulation 3(1)(a)(i) of Annex IV of the International Convention for the Prevention of Pollution from Ships, 1973 which provides that a sewage treatment plant shall meet operational requirements based on standards and test methods developed by the Organization,

NOTING ALSO Resolution 20 of the International Conference on Marine Pollution, 1973 which urges the Organization to take action to develop the above-mentioned standards and test methods as soon as possible,

HAVING CONSIDERED proposals of the Member Governments for effluent standards and test methods for sewage treatment plants aboard ships,

ADOPTS the Effluent Standards for Sewage Treatment Plants and the Guidelines for Performance Tests for Sewage Treatment Plants with respect to Effluent Standards, appearing at Annex A and Annex B hereto for the purposes of Regulation 3(1)(a)(i) of Annex IV of the above-mentioned Convention,

INVITES Member Governments:

- (a) to apply the Effluent Standards and Guidelines for approving sewage treatment plants;
- (b) to take steps to establish testing programmes in accordance with the Guidelines for Performance Tests as soon as possible;
- (c) to provide the Organization with a list of sewage treatment plants successfully meeting the standards; and

- (d) to issue an appropriate "Certificate of Type Test" as referred to in paragraph 1 of Annex A and to recognize such Certificates issued under the authority of other Governments as having the same validity as Certificates issued by them,

REQUESTS the Secretariat on the basis of the information received, to maintain and update a list of approved sewage treatment plants and to circulate it periodically to Governments,

ANNEX A

INTERNATIONAL EFFLUENT STANDARDS FOR SEWAGE TREATMENT PLANTS

1. For the purpose of Regulation 3(1)(a)(i) of Annex IV to the Convention, a sewage treatment plant should satisfy the following effluent standards when tested for its certificate of type test by the Administration:

(i) Faecal Coliform Standard

The geometric mean of the faecal coliform count of the samples of effluent taken during the test period should not exceed 250 faecal coliforms/100 ml M.P.N. (most probable number) as determined by a multiple tube fermentation analysis or an equivalent analytical procedure.

(ii) Suspended Solids Standard

(a) Where the equipment is tested on shore, the geometric mean of the total suspended solids content of the samples of effluent taken during the test period shall not exceed 50 mg/l.

(b) Where the equipment is tested aboard ship, the geometric mean of the total suspended solids content of the samples of effluent taken during the test period shall be not more than 100 mg/l above the suspended solids content of ambient water used for flushing purposes.

Analysis for suspended solids should be conducted in accordance with gravimetric methods approved by the Administration.

2. In addition to the above conditions, the plant should be so designed that the geometric mean of 5-day Biochemical Oxygen Demand (BOD_5) of the samples of effluent taken during the test period does not exceed 50 mg/l.

Administrations should satisfy themselves that the plant is designed to reduce both soluble and insoluble organic substances to meet this requirement.

ANNEX B

GUIDELINES FOR PERFORMANCE TESTS FOR SEWAGE TREATMENT
PLANTS WITH RESPECT TO EFFLUENT STANDARDS

I. GENERAL

1.1 These guidelines are intended to assist Administrations in establishing operational performance testing programmes for sewage treatment plants for the purpose of Regulation 3(1)(a)(i) of Annex IV of the Convention.

1.2 It is acknowledged that the performance of sewage treatment plants may vary considerably when the system is tested on-shore under shipboard simulated conditions or on-board ship under actual operating conditions. A review of actual test data showed this difference could be as high as a factor of two.

1.3 It is recognized that Administrations may wish to modify the specific details outlined in these guidelines to take account of very large or unique sewage treatment plants.

II. TESTING CONSIDERATIONS

A test for operational performance of a sewage treatment plant (hereafter referred to as "equipment") should be conducted in accordance with the following items. Unless otherwise noted, the items apply to both testing ashore and on board.

2.1 Raw Sewage Quality

For equipment tested ashore, the influent should be fresh sewage consisting of faecal matter, urine, toilet paper and flush water to which, for testing purposes, primary sewage sludge has been added as necessary to attain a minimum concentration of 500 mg/l of suspended solids.

For equipment tested aboard ship the influent may consist of the sewage generated aboard the vessel under normal operational conditions.

2.2 Duration of Test

The duration of the test period should be ten (10) days after steady-state conditions have been reached by the equipment under test.

2.3 Loading factors

The equipment should be tested under conditions of average, minimum and maximum volumetric loadings, as laid down in the manufacturer's specification. The Administration should undertake to assess the capability of the equipment to produce an effluent in accordance with the standards prescribed in Part I following zero, maximum, minimum and average volumetric loadings. The range of conditions under which the effluent standards were met should be recorded on the certificate.

2.4 Sampling Methods and Frequency

Administrations should ensure that the equipment is installed in a manner which facilitates the collection of samples. Sampling should be carried out in a manner and at a frequency which is representative of effluent quality. Sampling frequency should take account of the residence time of the influent in the equipment. A minimum of 40 effluent samples should be collected to permit a statistical analysis of the data (geometric mean, maximum, minimum, variance, etc.). An adequate number of influent samples should be collected to ensure compliance with item 1. Any disinfectant residual in samples should be neutralized when the sample is collected to prevent unrealistic bacteria kill or chemical oxidation of organic matter by the disinfectant brought about by artificially extended contact times.

2.5 Analytical Testing of Effluent

The Administration should give consideration to recording of other parameters in addition to those required (faecal coliform, suspended solids and BOD₅) with a view to future technological development. Parameters which might be considered include total solids, volatile solids, settleable solids, volatile suspended solids, chemical oxygen demand, turbidity, total phosphorous, pH, total organic carbon and total coliforms, faecal streptococci.

2.6 Disinfectant residual

The potential adverse environmental effects of many disinfectant residuals and by-products such as those associated with the use of chlorine or its compounds are well recognized. It is, therefore, recommended that Administrations encourage the use of ozone, ultra-violet irradiation or any other disinfectant, which minimizes the adverse environmental effects, whilst pursuing the faecal coliform standard. When chlorine is used as a disinfectant the Administrations should be satisfied that the best technical means are used to keep the disinfectant residual in the effluent as low as practicable.

2.7 Scale-up consideration

Only full-scale marine equipment should be accepted for test purposes. Administrations may certify a range of the manufacturer's equipment sizes employing the same principles and technology, but due consideration must be given to limitations on performance which might arise from scaling up. In the case of large or unique equipment, certification may be based on results of prototype equipment tests. Where possible confirmatory tests should be performed on the final installation of such equipment.

2.8 Salinity and Temperature

Tests for certification should be carried out over the range of temperature and salinity specified by the manufacturers, and Administrations should be satisfied that such specifications are adequate for the conditions under which the equipment must operate. Any limitation on the conditions of operation should be recorded on the certificate.

2.9 Tilt and Vibration

Administrations should be satisfied that the equipment can operate under conditions of tilt consistent with internationally acceptable shipboard practice. It may be necessary to subject control and sensor components to shock and vibration testing to verify their suitability for marine use.

2.10 Other Considerations

2.10.1 The type and model of the sewage treatment plant and the name of the manufacturer should be noted by means of a durable label firmly affixed directly to the unit.

2.10.2 Administrations should examine the manufacturer's installation, operating and maintenance manuals for adequacy and completeness.

2.10.3 Qualifications of testing facilities should be carefully examined by the Administration as a prerequisite to their participation in the testing programme. Every attempt should be made to assure uniformity among the various facilities.

III. PERIODIC SURVEYS

3. Administrations should endeavour to ensure, when conducting periodical surveys in accordance with Regulation 3(1)(b) of Annex IV, that the equipment continues to perform in accordance with the conditions outlined in Regulation 3(1)(a) of Annex IV.

ANNEX 26**RESOLUTION MEPC.159(55)****Adopted on 13 October 2006****REVISED GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS
AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution,

NOTING resolution MEPC.2(VI) adopted on 3 December 1976 by which the Marine Environment Protection Committee adopted, at its sixth session, the Recommendation on International Effluent Standards and Guidelines for Performance Tests for Sewage Treatment Plants and invited Governments to apply the Effluent Standards and Guidelines for approving sewage treatment plants; to take steps to establish testing programmes in accordance with the Guidelines for Performance Tests; and provide the Organization with a list of sewage treatment plants meeting the standards,

NOTING ALSO resolution MEPC.115(51) adopted on 1 April 2004 by which the Marine Environment Protection Committee adopted, at its fifty-first session, the revised MARPOL Annex IV and which entered into force on 1 August 2005,

NOTING FURTHER the provisions of regulation 9.1.1 of MARPOL Annex IV, in which reference is made to the above-mentioned guidelines,

RECOGNIZING that resolution MEPC.2(VI) should be amended in order that current trends for the protection of the marine environment and developments in the design and effectiveness of commercially available sewage treatment plants be reflected; and the proliferation of differing unilateral more stringent standards that might be imposed worldwide be avoided,

HAVING CONSIDERED the recommendation made by the Sub-Committee on Bulk Liquids and Gases, at its tenth session,

1. ADOPTS the Revised Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants, the text of which is set out in the Annex to this resolution;
2. INVITES Governments to:
 - (a) implement the Revised Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants and apply them so that all equipment installed on board on or after 1 January 2010 meets the Revised Guidelines in so far as is reasonable and practicable; and

- (b) provide the Organization with information on experiences gained from their application and, in particular, on successful testing of equipment against the Standards;

3. FURTHER INVITES Governments to issue an appropriate “Certificate of type approval for Sewage Treatment Plants” as referred to in paragraph 5.4.2 and the annex of the Revised Guidelines and to recognize such certificates issued under the authority of other Governments as having the same validity as certificates issued by them; and

4. SUPERSEDES the Recommendation on International Effluent Standards and Guidelines for Performance Tests for Sewage Treatment Plants contained in resolution MEPC.2(VI).

ANNEX

**REVISED GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS
AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS**

TABLE OF CONTENTS

- 1 Introduction
- 2 Definitions
- 3 General
- 4 Standards
- 5 Testing considerations
- 6 Renewal and additional surveys
- 7 Familiarization of ship personnel in the use of the sewage treatment plant

ANNEX

Form of Certificate of Type Approval for Sewage Treatment Plants and Appendix

REVISED GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS

1 INTRODUCTION

1.1 The Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) adopted resolution MEPC.2(VI) Recommendation on International Effluent Standards and Guidelines for Performance Tests for Sewage Treatment Plants in 1976.

1.2 This document contains the Revised Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants (Guidelines). These Guidelines are intended to assist Administrations in establishing operational performance testing programmes for sewage treatment plants for the purpose of type approval under regulation 9.1.1 of Annex IV of the Convention.

1.3 These Guidelines apply to sewage treatment plants installed on board on or after 1 January 2010.

2 DEFINITIONS

Annex IV – the revised Annex IV of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) as amended by resolution MEPC.115(51).

Convention – the International Convention for the Prevention of Pollution from Ships 1973/1978 (MARPOL 73/78).

Geometric mean – the n th root of the product of n numbers.

Greywater – is drainage from dishwater, shower, laundry, bath and washbasin drains.

Testing onboard – testing carried out on a sewage treatment plant that has been installed upon a ship.

Testing ashore – testing carried out on a sewage treatment plant prior to installation e.g. in the factory.

Thermotolerant coliforms – the group of coliform bacteria which produce gas from lactose in 48 hours at 44.5°C. These organisms are sometimes referred to as “faecal coliforms”; however, the term “thermotolerant coliforms” is now accepted as more appropriate, since not all of these organisms are of faecal origin.

3 GENERAL

3.1 An approved sewage treatment plant must meet the standards in section 4 and the tests outlined in these Guidelines. It should also be noted that, when ships are operating approved sewage treatment plants, Annex IV also provides that the effluent shall not produce visible floating solids or cause discolouration of the surrounding water.

3.2 It is acknowledged that the performance of sewage treatment plants may vary considerably when the system is tested ashore under simulated shipboard conditions or onboard a ship under actual operating conditions. Where testing ashore demonstrates that a system complies with the standards, but subsequent onboard testing does not meet the standards, the Administration should determine the reason and take it into account when deciding whether to type approve the plant.

3.3 It is recognized that Administrations may wish to modify the specific details outlined in these Guidelines to take account of very large, very small or unique sewage treatment plants.

4 STANDARDS

4.1 For the purpose of regulation 4.1 of Annex IV, a sewage treatment plant should satisfy the following effluent standards when tested for its Certificate of Type Approval by the Administration:

.1 Thermotolerant Coliform Standard

The geometric mean of the thermotolerant coliform count of the samples of effluent taken during the test period should not exceed 100 thermotolerant coliforms/100 ml as determined by membrane filter, multiple tube fermentation or an equivalent analytical procedure.

.2 Total Suspended Solids (TSS) Standard

(c) The geometric mean of the total suspended solids content of the samples of effluent taken during the test period shall not exceed 35 mg/l.

(d) Where the sewage treatment plant is tested onboard ship, the maximum total suspended solids content of the samples of effluent taken during the test period may be adjusted to take account of the total suspended solid content of the flushing water. In allowing this adjustment in maximum TSS, Administrations shall ensure sufficient tests of TSS are taken of the flushing water throughout the testing period to establish an accurate geometric mean to be used as the adjustment figure (defined as x). In no cases shall the maximum allowed TSS be greater than 35 plus x mg/l.

Method of testing should be by:

- .1 filtration of representative sample through a 0.45 μm filter membrane, drying at 105°C and weighing; or
- .2 centrifuging of a representative sample (for at least five minutes with mean acceleration of 2,800-3,200 g), drying at least 105°C and weighing; or
- .3 other internationally accepted equivalent test standard.

.3 Biochemical Oxygen Demand and Chemical Oxygen Demand

Administrations should satisfy themselves that the sewage treatment plant is designed to reduce both soluble and insoluble organic substances to meet the requirement that, the geometric mean of 5-day Biochemical Oxygen Demand (BOD₅) of the samples of effluent taken during the test period does not exceed 25 mg/l and the Chemical Oxygen Demand (COD) does not exceed 125 mg/l. The test method standard should be ISO 15705:2002 for COD and ISO 5815-1:2003 for BOD₅, or other internationally accepted equivalent test standards.

.4 pH

The pH of the samples of effluent taken during the test period shall be between 6 and 8.5.

.5 Zero or non-detected values

For thermolerant coliforms, zero values should be replaced with a value of 1 thermotolerant coliform/100 ml to allow the calculation of the geometric mean. For total suspended solids, biochemical oxygen demand and chemical oxygen demand, values below the limit of detection should be replaced with one half the limit of detection to allow the calculation of the geometric mean.

4.2 Where the sewage treatment plant has been tested ashore, the initial survey should include installation and commissioning of the sewage treatment plant.

5 TESTING CONSIDERATIONS

5.1 Testing of the operational performance of a sewage treatment plant should be conducted in accordance with the following subparagraphs. Unless otherwise noted, the subparagraphs apply to testing both onboard and ashore.

5.2 Raw sewage quality

5.2.1 Sewage treatment plants tested ashore - the influent should be fresh sewage consisting of faecal matter, urine, toilet paper and flush water to which, for testing purposes primary sewage sludge has been added as necessary to attain a minimum total suspended solids concentration appropriate for the number of persons and hydraulic loading for which the sewage treatment plant will be certified. The testing should take into account the type of system (for example vacuum or gravity toilets) and any water or greywater that may be added for flushing to the sewage before treatment. In any case the influent concentration of total suspended solids should be no less than 500 mg/l.

5.2.2 Sewage treatment plants tested onboard - the influent may consist of the sewage generated under normal operational conditions. In any case the average influent concentration of total suspended solids should be no less than 500 mg/l.

5.3 Duration and timing of test

5.3.1 The duration of the test period should be a minimum of 10 days and should be timed to capture normal operational conditions, taking into account the type of system and the number of persons and hydraulic loading for which the sewage treatment plant will be type approved. The test should commence after steady-state conditions have been reached by the sewage treatment plant under test.

5.4 Loading factors

5.4.1 During the test period the sewage treatment plant should be tested under conditions of minimum, average and maximum volumetric loadings.

- .1 For testing ashore, these loadings will be as laid down in the manufacturer's specifications. Figure 1 shows suggested timings for sampling each loading factor.
- .2 For testing onboard, minimum loading will represent that generated by the number of persons on the ship when it is alongside in port, and average and maximum loadings will represent those generated by the number of persons on the ship at sea and will take account of meal times and watch rotations.

5.4.2 The Administration should undertake to assess the capability of the sewage treatment plant to produce an effluent in accordance with the standards prescribed by section 4 following minimum, average and maximum volumetric loadings. The range of conditions under which the effluent standards were met should be recorded on the Certificate of Type Approval. The form of the Certificate of Type Approval and appendix is set out in the annex to these Guidelines.

5.5 Sampling methods and frequency

5.5.1 Administrations should ensure that the sewage treatment plant is installed in a manner which facilitates the collection of samples. Sampling should be carried out in a manner and at a frequency which is representative of the effluent quality. Figure 1 provides a suggested frequency for sampling, however, the frequency should take account of the residence time of the influent in the sewage treatment plant. A minimum of 40 effluent samples should be collected to allow a statistical analysis of the testing data (e.g. geometric mean, maximum, minimum, variance).

5.5.2 An influent sample should be taken and analyzed for every effluent sample taken and the results recorded to ensure compliance with section 4. If possible, additional influent and effluent samples should be taken to allow for a margin of error. Samples should be appropriately preserved prior to analysis particularly if there is to be a significant delay between collection and analysis or during times of high ambient temperature.

5.5.3 Any disinfectant residual in samples should be neutralized when the sample is collected to prevent unrealistic bacteria kill or chemical oxidation of organic matter by the disinfectant brought about by artificially extended contact times. Chlorine (if used) concentration and pH should be measured prior to neutralization.

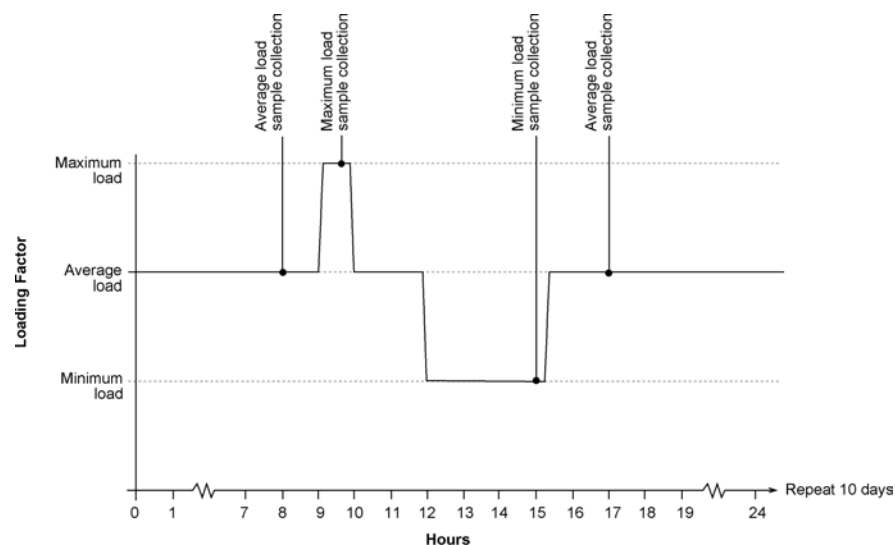


Figure 1: Suggested hydraulic loading factors and sampling frequency for testing sewage treatment plants. May be modified as necessary to take account of characteristics of individual sewage treatment plants

5.6 Analytical testing of effluent

5.6.1 The Administration should give consideration to the recording of other parameters in addition to those required (thermotolerant coliforms, total suspended solids, BOD₅, COD, pH and residual chlorine) with a view to future technological development. Parameters which might be considered include total solids, volatile solids, settleable solids, volatile suspended solids, turbidity, total phosphorus, total organic carbon, total coliforms and faecal streptococci.

5.7 Disinfectant residual

5.7.1 The potential adverse environmental effects of many disinfectant residuals and by-products, such as those associated with the use of chlorine or its compounds, are well recognized. It is, therefore, recommended that Administrations encourage the use of ozone, ultra-violet irradiation or any other disinfectants which minimize adverse environmental effects, whilst pursuing the thermotolerant coliform standard. When chlorine is used as a disinfectant, the Administration should be satisfied that the best technical practice is used to keep the disinfectant residual in the effluent below 0.5 mg/l.

5.8 Scaling considerations

5.8.1 Only full-scale marine sewage treatment plants should be accepted for testing purposes. The Administration may certify a range of the manufacturer's equipment sizes employing the same principles and technology, but due consideration must be given to limitations on performance which might arise from scaling up or scaling down. In the case of very large, very small or unique sewage treatment plants, certification may be based on results of prototype tests. Where possible, confirmatory tests should be performed on the final installation of such sewage treatment plants.

5.9 Environmental testing of the sewage treatment plant

5.9.1 The Administration should be satisfied that the sewage treatment plant can operate under conditions of tilt consistent with internationally acceptable shipboard practice.

5.9.2 Tests for certification should be carried out over the range of temperature and salinity specified by the manufacturer, and the Administration should be satisfied that such specifications are adequate for the conditions under which the equipment must operate.

5.9.3 Control and sensor components should be subjected to environmental testing to verify their suitability for marine use. The Test Specifications section in part 3 of the annex to resolution MEPC.107(49) provides guidance in this respect.

5.9.4 Any limitation on the conditions of operation should be recorded on the Certificate.

5.9.5 The Administration should also consider requiring the manufacturer to include in the operating and maintenance manuals, a list of chemicals and materials suitable for use in the operation of the sewage treatment plant.

5.10 Other considerations

5.10.1 The type and model of the sewage treatment plant and the name of the manufacturer should be noted by means of a durable label firmly affixed directly to the sewage treatment plant. This label should include the date of manufacture and any operational or installation limits considered necessary by the manufacturer or the Administration.

5.10.2 Administrations should examine the manufacturer's installation, operating and maintenance manuals for adequacy and completeness. The ship should have on board at all times a manual detailing the operational and maintenance procedures for the sewage treatment plant.

5.10.3 Qualifications of testing facilities should be carefully examined by the Administration as a prerequisite to their participation in the testing programme. Every attempt should be made to assure uniformity among the various facilities.

6 RENEWAL AND ADDITIONAL SURVEYS

6.1 Administrations should endeavour to ensure, when conducting renewal or additional surveys in accordance with regulations 4.1.2 and 4.1.3 of Annex IV, that the sewage treatment plant continues to perform in accordance with the conditions outlined in regulation 4.1.1 of Annex IV.

7 FAMILIARIZATION OF SHIP PERSONNEL IN THE USE OF THE SEWAGE TREATMENT PLANT

7.1 Recognizing that the appropriate regulations relating to familiarization are contained within the Ships Safety Management Systems under the International Safety Management Code, Administrations are reminded that ship staff training should include familiarization in the operation and maintenance of the sewage treatment plant.

ANNEX

FORM OF CERTIFICATE OF TYPE APPROVAL
FOR SEWAGE TREATMENT PLANTS AND APPENDIX

BADGE
OR
CIPHER

NAME OF ADMINISTRATION

**CERTIFICATE OF TYPE APPROVAL
FOR SEWAGE TREATMENT PLANTS**

This is to certify that the Sewage Treatment Plant, Type,
having a designed hydraulic loading of cubic metres per day, (m³/day), an organic loading of
..... kg per day Biochemical Oxygen Demand (BOD) and of the design shown on Drawings Nos.
manufactured by

has been examined and satisfactorily tested in accordance with the International Maritime Organization
resolution MEPC.159(55) to meet the operational requirements referred to in regulation 9.1.1 of Annex IV
of the International Convention for the Prevention of Pollution from Ships, 1973/78 as modified by
resolution MEPC.115(51).

The tests on the sewage treatment plant were carried out
ashore at*
onboard at*
and completed on

The sewage treatment plant was tested and produced an effluent which, on analysis, produces:

- (i) a geometric mean of no more than 100 thermotolerant coliforms/100 ml;
- (ii) a geometric mean of total suspended solids of 35 mg/l if tested ashore or the maximum total
suspended solids not exceeding 35 plus x mg/l for the ambient water used for flushing purposes if
tested on board;
- (iii) a geometric mean of 5-day Biochemical Oxygen Demand (BOD₅) of no more than 25 mg/l;
- (iv) a geometric mean of Chemical Oxygen Demand of no more than 125 mg/l;
- (v) pH of the effluent is between 6 and 8.5.

The Administration is satisfied that the sewage treatment plant can operate at angles of inclination
of 22.5° in any plane from the normal operating position.

Details of the tests and the results obtained are shown on the Appendix to this Certificate.

A plate or durable label containing data of the manufacturer's name, type and serial numbers, hydraulic
loading and date of manufacture is to be fitted on each sewage treatment plant.

A copy of this Certificate shall be carried on board any ship equipped with the above described sewage
treatment plant.

Official stamp Signed

Administration of

Dated this.....day.....of.....20....

* Delete as appropriate.

BADGE
OR
CIPHER

APPENDIX TO
CERTIFICATE OF TYPE APPROVAL FOR SEWAGE TREATMENT PLANTS

Test results and details of tests conducted on samples from the Sewage Treatment Plant in accordance with resolution MEPC.159(55):

Sewage Treatment Plant, Type
 Manufactured by
 Organization conducting the test
 Designed hydraulic loading m³/day
 Designed organic loading kg/day BOD

Number of effluent samples tested
 Number of influent samples tested
 Raw sewage (influent) quality mg/l Total Suspended Solids
 Maximum hydraulic loading m³/day
 Minimum hydraulic loading m³/day
 Average hydraulic loading m³/day

Geometric Mean of Total
 Suspended Solids mg/l
 Geometric Mean of the thermotolerant
 coliform count coliforms/100 ml
 Geometric Mean of BOD₅ mg/l

Type of disinfectant used
 If Chlorine - residual Chlorine:
 Maximum mg/l
 Minimum mg/l
 Geometric Mean mg/l

Was the sewage treatment plant tested with:
 Fresh Water flushing? Yes/No*
 Salt Water flushing? Yes/No*
 Fresh and Salt Water flushing? Yes/No*
 Greywater added? Yes – proportion: /No*

Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of resolution MEPC.159(55):
 Temperature Yes/No*
 Humidity Yes/No*
 Inclination Yes/No*
 Vibration Yes/No*
 Reliability of Electrical and Electronic Equipment Yes/No*

Limitations and the conditions of operation are imposed:
 Salinity
 Temperature
 Humidity
 Inclination
 Vibration

Results of other parameters tested
 Official stamp Signed
 Administration of Dated this day of 20

* Delete as appropriate.

ANNEX 22

RESOLUTION MEPC.227(64)

Adopted on 5 October 2012

**2012 GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS
AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution,

NOTING resolution MEPC.159(55) by which the Committee adopted, at its fifty-fifth session, the *Revised Guidelines on implementation of effluent standards and performance tests for sewage treatment plants* (the Revised Guidelines) and invited Governments to apply the Revised Guidelines when approving sewage treatment plants and provide the Organization with information on experience gained with their application, in particular, on successful testing of equipment against the standards contained in the Revised Guidelines,

NOTING ALSO resolution MEPC.200(62) by which the Committee adopted, at its sixty-second session, amendments to MARPOL Annex IV concerning Special Area provisions and the designation of the Baltic Sea as a special area, which are expected to enter into force on 1 January 2013,

NOTING FURTHER the provisions of regulations 9.1.1 and 9.2.1 of MARPOL Annex IV, in which reference is made to the above-mentioned Revised Guidelines,

RECOGNIZING that the Revised Guidelines should be amended in order that current trends for the protection of the marine environment, the need to address particular oceanographical and ecological conditions of the special area designated, and developments in the design and effectiveness of commercially available sewage treatment plants be reflected; and the proliferation of differing unilateral more stringent standards that might be imposed worldwide be avoided,

HAVING CONSIDERED the recommendation made by the Sub-Committee on Ship Design and Equipment, at its fifty-sixth session,

1. ADOPTS the *2012 Guidelines on implementation of effluent standards and performance tests for sewage treatment plants*, the text of which is set out in the annex to this resolution;

2. INVITES governments to:

- .1 implement the 2012 Guidelines and apply them on or after 1 January 2016; and
- .2 provide the Organization with information on experience gained with the application of the 2012 Guidelines;

3. ALSO INVITES Governments to issue an appropriate "Certificate of type approval for sewage treatment plants" as referred to in paragraph 5.4.2 and the annex of the 2012 Guidelines and to recognize certificates issued under the authority of other Governments as having the same validity as certificates issued by them;
4. SUPERSEDES the *Revised Guidelines on implementation of effluent standards and performance tests for sewage treatment plants*, adopted by resolution MEPC.159(55).

ANNEX

**2012 GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS
AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS**

TABLE OF CONTENTS

- 1 Introduction
- 2 Definitions
- 3 General
- 4 Technical specification
- 5 Testing considerations
- 6 Renewal and additional surveys
- 7 Familiarization of ship personnel in the use of the sewage treatment plant
- 8 Maintenance

ANNEX

Form of Certificate of Type Approval for Sewage Treatment Plants and appendix

2012 GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS

1 INTRODUCTION

1.1 Background

1.1.1 The Marine Environment Protection Committee (MEPC) adopted resolution MEPC.2(VI), *Recommendation on International Effluent Standards and Guidelines for Performance Tests for Sewage Treatment Plants in 1976*. MEPC 55 in October 2006 adopted, by resolution MEPC.159(55), the *Revised Guidelines on implementation of effluent standards and performance tests for sewage treatment plants*, which superseded resolution MEPC.2(VI).

1.1.2 MEPC 62 adopted resolution MEPC.200(62) amending MARPOL by designating the Baltic Sea as a special area under Annex IV and prohibiting the discharge of sewage effluent from passenger ships operating in special areas, unless a passenger ship has in operation an approved sewage treatment plant implementing effluent standards and performance tests defined in the *2012 Guidelines on implementation of effluent standards and performance tests for sewage treatment plants* (the Guidelines).

1.2 Application

1.2.1 These Guidelines amend the *Revised guidelines on implementation of effluent standards and performance tests for sewage treatment plants*, adopted by resolution MEPC.159(55), by including the standards of section 4.2 that only apply to passenger ships which operate in MARPOL Annex IV special areas and which intend to discharge treated sewage effluent into the sea.

1.2.2 The requirements of these Guidelines, with the exception of the requirements in section 4.2, will apply to sewage treatment plants installed on or after 1 January 2016 on:

- .1 ships, other than passenger ships, in all areas; and
- .2 passenger ships outside MARPOL Annex IV special areas.

1.2.3 The requirements of these Guidelines, including those in section 4.2, will apply to sewage treatment plants installed on:

- .1 new passenger ships when operating in a MARPOL Annex IV special area and intending to discharge treated sewage effluent into the sea on or after 1 January 2016; and
- .2 existing passenger ships when operating in a MARPOL Annex IV special area and intending to discharge treated sewage effluent into the sea on or after 1 January 2018.

1.2.4 Sewage treatment plants installed prior to 1 January 2016 and on or after 1 January 2010, on ships other than passenger ships operating in MARPOL Annex IV special areas and intending to discharge treated sewage effluent into the sea, should comply with resolution MEPC.159(55).

1.2.5 Sewage treatment plants installed prior to 1 January 2010 on ships other than passenger ships operating in MARPOL Annex IV special areas and intending to discharge treated sewage effluent into the sea, should comply with resolution MEPC.2(VI).

1.3 Purpose

1.3.1 These Guidelines and specifications address the design, installation, performance and testing of sewage treatment plants required by regulations 9.1.1 and 9.2.1 of MARPOL Annex IV.

1.3.2 The purpose of these Guidelines and specifications is:

- .1 to provide a uniform interpretation of the requirements of regulations 9.1.1 and 9.2.1 of MARPOL Annex IV;
- .2 to assist Administrations in determining appropriate design, construction and operational testing and performance parameters for sewage treatment plants when such equipment is fitted in ships flying the flag of their State; and
- .3 to provide guidance for installation requirements.

2 DEFINITIONS

2.1 *Annex IV* – the revised Annex IV of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 and 1997 Protocols (MARPOL), as amended by resolutions MEPC.115(51) and MEPC.200(62).

2.2 *Convention* – the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 and 1997 Protocols (MARPOL).

2.3 Dilution (Q_d) – is dilution water, grey water, process water, and/or seawater introduced to the sewage treatment plant after the influent sample point and after the influent flow measurement device, see figure 1.

2.4 *Effluent* (Q_e) – treated wastewater produced by the sewage treatment plant, see figure 1.

2.5 Flush water – transport medium used to carry sewage or other wastes from toilets or urinals to the treatment system.

2.6 *Geometric mean* – the n th root of the product of n numbers.

2.7 *Grey water* – is drainage from dishwater, galley sink, shower, laundry, bath and washbasin drains and does not include drainage from toilets, urinals, hospitals, and animal spaces, as defined in regulation 1.3 of MARPOL Annex IV and does not include drainage from cargo spaces.

2.8 *Hydraulic loading* – system design flow rate of waste water (Q_i) into the sewage treatment plant.

2.9 *Influent* (Q_i) – Liquid containing sewage, grey water or other liquid streams, to be processed by the treatment plant, see figure 1.

2.10 *Sample point* – A point for manual collection of a representative sample of influent and effluent without opening tanks, voids or vents, see figure 1.

2.11 *Testing on board* – testing, for the purpose of type approval, carried out on a sewage treatment plant installed on a ship.

2.12 *Testing ashore* – testing ashore, for the purpose of type approval, carried out on a sewage treatment plant.

2.13 *Thermotolerant coliforms* – the group of coliform bacteria which produce gas from lactose in 48 hours at 44.5°C. These organisms are sometimes referred to as "faecal coliforms"; however, the term "thermotolerant coliforms" is now accepted as more appropriate, since not all of these organisms are of faecal origin.

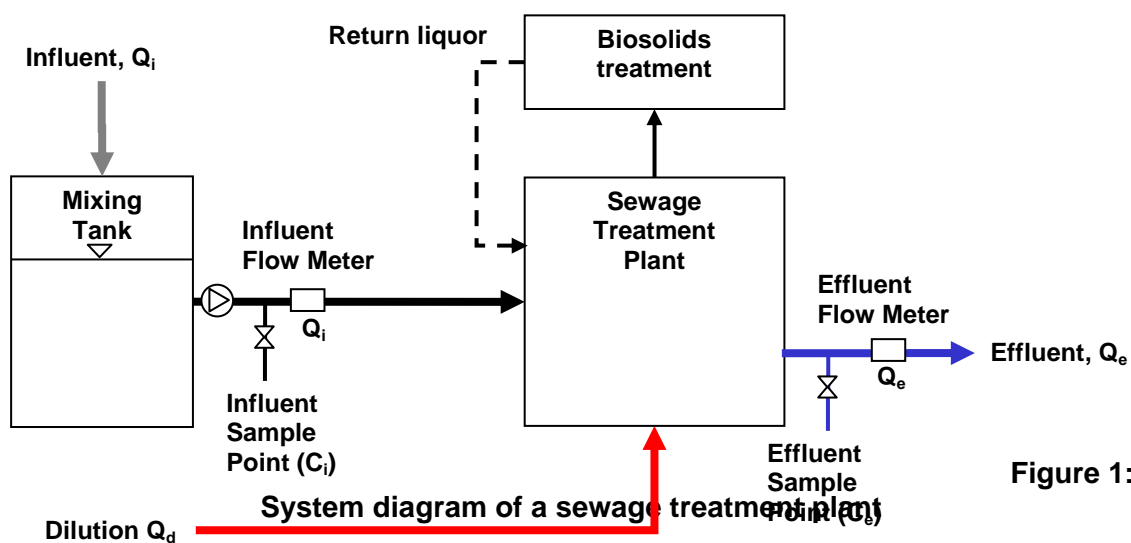


Figure 1:

3 GENERAL

3.1 An approved sewage treatment plant should meet the technical specifications in section 4 and the tests outlined in these Guidelines. However, section 4.2 on nitrogen and phosphorous removal applies to passenger ships operating within a special area intending to discharge treated sewage effluent into the sea. It should also be noted that, when ships are operating approved sewage treatment plants, MARPOL Annex IV also provides that the effluent shall not produce visible floating solids or cause discolouration of the surrounding water.

3.2 In meeting the effluent standards in section 4, an approved sewage treatment plant should not rely solely on dilution of wastewater. Where amounts of dilution are deemed essential to a treatment process, the effluent standards in section 4 having concentration limits (mg/l) should be adjusted proportionally using dilution compensation factor Q_i/Q_e to take account of dilution Q_d . In addition, for effluent standards in section 4 having a percentage reduction, the geometric mean of the daily percentage reduction values should be calculated using the accumulated flow Q_i and Q_e over each 24-hour test day, in terms of l/day, multiplied by the geometric mean of the corresponding concentration C_i and C_e for the same 24-hour test day, in terms of mg/l.

The overall percentage reduction over the entire test period n is:

$$PR = \sqrt[n]{PR_1 \cdot PR_2 \cdots PR_n} \cdot 100 ,$$

where PR_n is the daily removal value:

$$PR_n = \frac{\left(\frac{(Q_i)_n \cdot \sqrt[s]{(C_i)_1 \cdot (C_i)_2 \cdots (C_i)_s}}{1000} \right)_n - \left(\frac{(Q_e)_n \cdot \sqrt[s]{(C_e)_1 \cdot (C_e)_2 \cdots (C_e)_s}}{1000} \right)_n}{\left(\frac{(Q_i)_n \cdot \sqrt[s]{(C_i)_1 \cdot (C_i)_2 \cdots (C_i)_s}}{1000} \right)_n}$$

where:

n represents the test day number; and

s represents the sample number collected on test day n

3.3 It is acknowledged that the performance of sewage treatment plants may vary considerably when the system is tested ashore under simulated shipboard conditions or on board a ship under actual operating conditions. Where testing ashore demonstrates that a system complies with the standards, but subsequent onboard testing does not meet the standards, the Administration should determine the reason and take it into account when deciding whether to type approve the plant.

3.4 It is recognized that Administrations may wish to modify the specific details outlined in these Guidelines to take account of very large, very small or unique sewage treatment plants.

4 TECHNICAL SPECIFICATION

4.1 For the purpose of regulations 9.1.1 and 9.2.1 of MARPOL Annex IV, a sewage treatment plant should meet the following effluent standards when tested for its Certificate of Type Approval by the Administration:

.1 Thermotolerant Coliform Standard

The geometric mean of the thermotolerant coliform count of the samples of effluent taken during the test period should not exceed 100 thermotolerant coliforms/100 ml as determined by membrane filter, multiple tube fermentation or an equivalent analytical procedure.

.2 Total Suspended Solids (TSS) Standard

.1 The geometric mean of the total suspended solids content of the samples of effluent taken during the test period should not exceed 35 Qi/Qe mg/l.

- .2 Where the sewage treatment plant is tested on board ship, the maximum total suspended solids content of the samples of effluent taken during the test period may be adjusted to take account of the total suspended solid content of the flushing water. In allowing this adjustment in maximum TSS, Administrations should ensure sufficient tests of TSS are taken of the flushing water throughout the testing period to establish an accurate geometric mean to be used as the adjustment figure (defined as x). In no cases should the maximum allowed TSS be greater than $(35 \text{ plus } x) Q_i/Q_e$ mg/l.

Method of testing should be by:

- .1 filtration of representative sample through a 0.45 μm filter membrane, drying at 105°C and weighing; or
 - .2 centrifuging of a representative sample (for at least five minutes with mean acceleration of 2,800-3,200 g), drying at least 105°C and weighing; or
 - .3 other internationally accepted equivalent test standard.
- .3 Biochemical oxygen demand without nitrification and chemical oxygen demand

Administrations should ensure the sewage treatment plant is designed to reduce both soluble and insoluble organic substances to meet the requirement that, the geometric mean of 5-day biochemical oxygen demand without nitrification (BOD_5 without nitrification) of the samples of effluent taken during the test period does not exceed $25 Q_i/Q_e$ mg/l and the chemical oxygen demand (COD) does not exceed $125 Q_i/Q_e$ mg/l. The test method standard should be ISO 5815 1:2003 for BOD_5 without nitrification and ISO 15705:2002 for COD, or other internationally accepted equivalent test standards.

- .4 pH

The pH of the samples of effluent taken during the test period should be between 6 and 8.5.

- .5 Zero or non-detected values

For thermotolerant coliforms zero values should be replaced with a value of 1 thermotolerant coliform/100 ml to allow the calculation of the geometric mean. For total suspended solids, biochemical oxygen demand without nitrification and chemical oxygen demand values below the limit of detection should be replaced with one half the limit of detection to allow the calculation of the geometric mean.

4.2 For the purpose of regulation 9.2.1 of MARPOL Annex IV, a sewage treatment plant installed on a passenger ship intending to discharge sewage effluent in special areas should additionally meet the following effluent standards when tested for its Certificate of Type Approval by the Administration:

.1 Nitrogen and phosphorus removal standard

The geometric mean of the total nitrogen and phosphorus content of the samples of effluent taken during the test period should not exceed:

.1 total nitrogen¹: 20 Qi/Qe mg/l or at least 70 per cent reduction²;

.2 total phosphorus: 1.0 Qi/Qe mg/l or at least 80 per cent reduction³.

.2 Method of testing should be:

.1 ISO 29441:2010 for total nitrogen; and

.2 ISO 6878:2004 for total phosphorus; or

.3 other internationally accepted equivalent test standard.

4.3 Where the sewage treatment plant has been tested ashore, the initial survey should include installation and commissioning of the sewage treatment plant.

4.4 A review of the Nitrogen and Phosphorus removal standard set forth in paragraph 4.2.1 of the Guidelines should be undertaken by the Committee at its sixty-seventh session (second part of year 2014) to determine that the required removal standards for Nitrogen and Phosphorus are met by type approved sewage treatment plants, or such systems in development, taking into account the results of on board and ashore testing in accordance with section 5 of the 2012 Guidelines. In order to accomplish this, the Committee decided to establish a review group at MEPC 67.

4.5 The Committee, based on the information provided by the review group, should decide whether it is possible for ships to comply with the standard in paragraph 4.2.1 with the dates set out in paragraph 1.2.3. If a decision is taken that it is not possible or practicable for ships to comply, then the Guidelines should be amended accordingly.

5 TESTING CONSIDERATIONS

5.1 Testing of the operational performance of a sewage treatment plant should be conducted in accordance with the following subparagraphs. Unless otherwise noted, the subparagraphs apply to testing both on board and ashore.

5.2 Raw sewage quality

5.2.1 Sewage treatment plants tested ashore – the influent should be fresh sewage consisting of faecal matter, urine, toilet paper and flush water to which, for testing purposes primary sewage sludge has been added as necessary to attain a minimum total suspended solids concentration appropriate for the number of persons and hydraulic loading for which the sewage treatment plant will be certified. The testing should take into account the type of system (for example, vacuum or gravity toilets) and any water or grey water that may be

¹ Total nitrogen means the sum of total Kjeldahl nitrogen (organic and ammoniacal nitrogen) nitrate-nitrogen and nitrite-nitrogen.

² Reduction in relation to the load of the influent.

³ Reduction in relation to the load of the influent.

added for flushing to the sewage before treatment. In any case the influent concentration of total suspended solids should be no less than 500 mg/l.

5.2.2 Sewage treatment plants tested on board – the influent may consist of the sewage generated under normal operational conditions. In any case the average influent concentration of total suspended solids should be not less than 500 mg/l.

5.2.3 Influent should be assessed without the contribution of any return liquors, wash water, or recirculates, etc., generated from the sewage treatment plant.

5.3 Duration and timing of test

The duration of the test period should be a minimum of 10 days and should be timed to capture normal operational conditions, taking into account the type of system and the number of persons and hydraulic loading for which the sewage treatment plant will be type approved. Noting that the systems need a period of stabilization, the test should commence after steady-state conditions have been reached by the sewage treatment plant under test.

5.4 Loading factors

5.4.1 During the test period, the sewage treatment plant should be tested under conditions of minimum, average and maximum volumetric loadings:

- .1 for testing ashore, these loadings should be as laid down in the manufacturer's specifications. Figure 2 shows suggested timings for sampling each loading factor; and
- .2 for testing on board, minimum loading should represent that generated by the number of persons on the ship when it is alongside in port, and average and maximum loadings should represent those generated by the number of persons on the ship at sea and should take account of meal times and watch rotations.

5.4.2 The Administration should undertake to assess the capability of the sewage treatment plant to produce an effluent in accordance with the standards prescribed by section 4 following minimum, average and maximum volumetric loadings. The range of conditions under which the effluent standards were met should be recorded on the Certificate of Type Approval. The form of the Certificate of Type Approval and appendix is set out in the annex to these Guidelines.

5.5 Sampling methods and frequency

5.5.1 Administrations should ensure that the sewage treatment plant is installed in a manner which facilitates the collection of samples, see figure 1. Sampling should be carried out in a manner and at a frequency which is representative of the effluent quality. Figure 2 provides a suggested frequency for sampling, however, the frequency should take account of the residence time of the influent in the sewage treatment plant. A minimum of 40 effluent samples should be collected to allow a statistical analysis of the testing data (e.g. geometric mean, maximum, minimum and variance).

5.5.2 Influent sample point should be upstream of any return liquors, wash water, or recirculates generated from the sewage treatment plant. Where such a sample point is not readily available on ships, the flows and concentrations of these return liquors, wash water, or

recirculates generated from the sewage treatment plant should be measured, so that the load can be taken away from the load of influent.

5.5.3 An influent sample should be taken and analysed for every effluent sample taken and the results recorded to ensure compliance with section 4. If possible, additional influent and effluent samples should be taken to allow for a margin of error. Samples should be appropriately preserved prior to analysis particularly if there is to be a significant delay between collection and analysis or during times of high ambient temperature.

5.5.4 Any disinfectant residual in samples should be neutralized when the sample is collected to prevent unrealistic bacteria kill or chemical oxidation of organic matter by the disinfectant brought about by artificially extended contact times. Chlorine (if used) concentration and pH should be measured prior to neutralization.

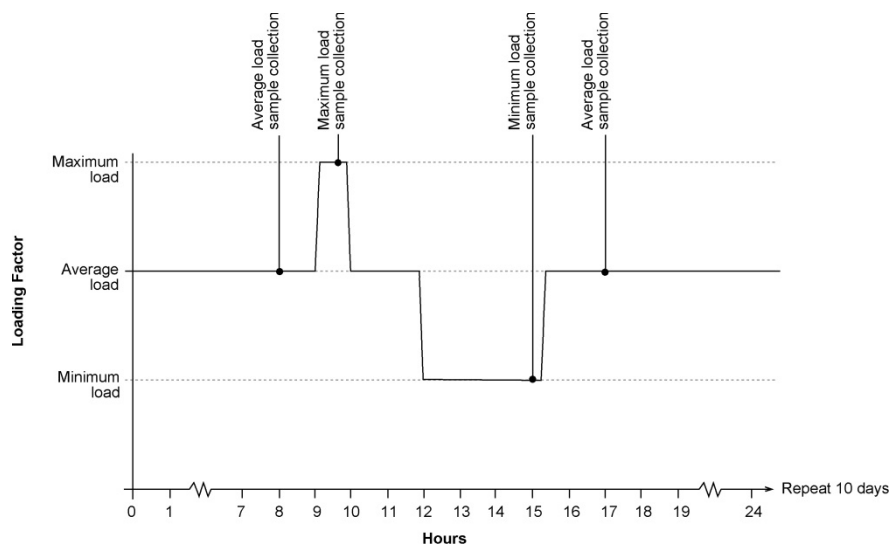


Figure 2: Suggested hydraulic loading factors and sampling frequency for testing sewage treatment plants. May be modified as necessary to take account of characteristics of individual sewage treatment plants

5.6 Analytical testing of effluent

The Administration should give consideration to the recording of other parameters in addition to those required (thermotolerant coliforms, total suspended solids, BOD₅ without nitrification, COD, pH and residual chlorine) with a view to future technological development. These parameters include total solids, volatile solids, settleable solids, volatile suspended solids, turbidity, total organic carbon, total coliforms and faecal streptococci.

5.7 Disinfectant residual

The potential adverse environmental effects of many disinfectant residuals and by-products, such as those associated with the use of chlorine or its compounds, are well recognized. It is, therefore, recommended that Administrations encourage the use of ozone, ultraviolet irradiation or any other disinfectants which minimize adverse environmental effects, whilst pursuing the thermotolerant coliform standard. When chlorine is used as a disinfectant, the Administration should be satisfied that the best technical practice is used to keep the disinfectant residual in the effluent below 0.5 mg/l.

5.8 Scaling considerations

Only full-scale marine sewage treatment plants should be accepted for testing purposes. The Administration may certify a range of the manufacturer's equipment sizes employing the same principles and technology, but due consideration should be given to limitations on performance which might arise from scaling up or scaling down. In the case of very large, very small or unique sewage treatment plants, certification may be based on results of prototype tests. Where possible, confirmatory tests should be performed on the final installation of such sewage treatment plants.

5.9 Environmental testing of the sewage treatment plant

5.9.1 The Administration should ensure that the sewage treatment plant can operate under conditions of tilt consistent with internationally acceptable shipboard practice up to 22.5° in any plane from the normal operating position.

5.9.2 Tests for certification should be carried out over the range of salinity and the range of temperatures for ambient air and flush water specified by the manufacturer, and the Administration should be satisfied that such specifications are adequate for the conditions under which the equipment must operate.

5.9.3 Control and sensor components should be subjected to environmental testing to verify their suitability for marine use. The Test Specifications section in part 3 of the annex to the Revised Guidelines and Specifications for Pollution Prevention Equipment for Machinery Space Bilges of Ships (resolution MEPC.107(49)) provides guidance in this respect.

5.9.4 Any limitation on the conditions of operation should be recorded on the certificate.

5.9.5 The Administration should also consider requiring the manufacturer to include in the operating and maintenance manuals, a list of chemicals and materials suitable for use in the operation of the sewage treatment plant.

5.10 Other considerations

5.10.1 The type and model of the sewage treatment plant and the name of the manufacturer should be noted by means of a durable label firmly affixed directly to the sewage treatment plant. This label should include the date of manufacture and any operational or installation limits considered necessary by the manufacturer or the Administration.

5.10.2 Administrations should examine the manufacturer's installation, operating and maintenance manuals for adequacy and completeness. The ship should have on board at all times a manual detailing the operational and maintenance procedures for the sewage treatment plant, including safety information about the chemicals and materials actually used in the operation of the sewage treatment plant.

5.10.3 Qualifications of testing facilities should be carefully examined by the Administration as a prerequisite to their participation in the testing programme. Every attempt should be made to assure uniformity among the various facilities.

6 RENEWAL AND ADDITIONAL SURVEYS

Administrations should endeavour to ensure, when conducting renewal or additional surveys in accordance with regulations 4.1.2 and 4.1.3 of MARPOL Annex IV, that the sewage treatment plant continues to perform in accordance with the conditions outlined in regulation 4.1.1 of MARPOL Annex IV.

7 FAMILIARIZATION OF SHIP PERSONNEL IN THE USE OF THE SEWAGE TREATMENT PLANT

Recognizing that the appropriate regulations relating to familiarization are contained within the Ships Safety Management Systems under the International Safety Management Code, Administrations are reminded that ship staff training should include familiarization in the operation and maintenance of the sewage treatment plant.

8 MAINTENANCE

Routine maintenance of the system should be clearly defined by the manufacturer in the associated operating and maintenance manuals. All routine and repair maintenance should be recorded.

ANNEX

FORM OF CERTIFICATE OF TYPE APPROVAL
FOR SEWAGE TREATMENT PLANTS AND APPENDIX

BADGE
OR
CIPHER

NAME OF ADMINISTRATION

**CERTIFICATE OF TYPE APPROVAL
FOR SEWAGE TREATMENT PLANTS**

This is to certify that the sewage treatment plant, type....., having a designed hydraulic loading of cubic metres per day, (m^3/day), an organic loading of kg per day biochemical oxygen demand without nitrification (BOD_5 without nitrification) and of the design shown on drawings Nos. manufactured by has been examined and satisfactorily tested in accordance with the International Maritime Organization resolution MEPC.227(64) to meet the operational requirements referred to in regulations 9.1.1 and 9.2.1 of MARPOL Annex IV of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 and 1997 Protocols (as amended by resolutions MEPC.115(51) and MEPC.200(62)).

The tests on the sewage treatment plant were carried out ashore at* on board at* and completed on

The sewage treatment plant was tested and produced an effluent which, on analysis, produces:

- .1 a geometric mean of no more than 100 thermotolerant coliforms/100 ml;
- .2 a geometric mean of total suspended solids of 35 Q_i/Q_e mg/l if tested ashore or the maximum total suspended solids not exceeding (35 plus x) Q_i/Q_e mg/l for the ambient water used for flushing purposes if tested on board;
- .3 a geometric mean of 5-day biochemical oxygen demand without nitrification (BOD_5 without nitrification) of no more than 25 Q_i/Q_e mg/l;
- .4 a geometric mean of chemical oxygen demand (COD) of no more than 125 Q_i/Q_e mg/l;
- .5 pH between 6 and 8.5;
- .6 a geometric mean of total nitrogen of no more than 20 Q_i/Q_e mg/l or at least 70 per cent reduction; and
- .7 a geometric mean of total phosphorus of no more than 1.0 Q_i/Q_e mg/l or at least 80 per cent reduction**.

The Administration confirms that the sewage treatment plant can operate at angles of inclination of 22.5° in any plane from the normal operating position.

Details of the tests and the results obtained are shown on the appendix to this Certificate.

* Delete as appropriate.

** Delete for ships other than passenger ships intending to discharge sewage effluent in Special Areas.

A plate or durable label containing data of the manufacturer's name, type and serial numbers, hydraulic loading and date of manufacture should be fitted on each sewage treatment plant.

A copy of this certificate should be carried on board any ship equipped with the above described sewage treatment plant.

Official stamp

Signed

.....

Administration of

Dated this day of..... 20.....

**APPENDIX TO
CERTIFICATE OF TYPE APPROVAL FOR SEWAGE TREATMENT PLANTS**

BADGE OR CIPHER

Test results and details of tests conducted on samples from the sewage treatment plant in accordance with resolution MEPC.227(64):

Sewage treatment plant, Type

Manufactured by

Organization conducting the test

Designed hydraulic loadingm³/day

Designed organic loading kg/day BOD

Number of effluent samples tested

Number of influent samples tested

Total suspended solids influent quality mg/l

Total nitrogen influent quality.....mg/l as nitrogen*

Total phosphorus influent quality.....mg/l as phosphorus*

BOD₅ without nitrification influent quality mg/l

Maximum hydraulic loading m³/day

Minimum hydraulic loading m³/day

Average hydraulic loading (Qi)..... m³/day

Effluent flow (Qe)..... m³/day

Dilution compensation factor (Qi/Qe).....

Geometric mean of total suspended solidsmg/l

Geometric mean of the thermotolerant coliform count..... coliforms/100 ml

Geometric mean of BOD₅ without nitrification mg/l

Geometric mean of CODmg/l

Geometric mean of total nitrogenmg/l* or %*

Geometric mean of total phosphorus.....mg/l* or %*

Maximum pH:

Minimum pH:.....

Type of disinfectant used

If Chlorine - residual Chlorine:

Maximum mg/l

Minimum mg/l

Geometric Mean mg/l

Was the sewage treatment plant tested with:

Fresh water flushing? Yes/No*

Salt water flushing? Yes/No*

Fresh and salt water flushing? Yes/No*

Grey water added? Yes – proportion: /No*

Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of resolution MEPC.227(64):

* Delete as appropriate.

Temperature Yes/No*
Humidity Yes/No*
Inclination Yes/No*
Vibration Yes/No*
Reliability of Electrical and Electronic Equipment Yes/No*

Limitations and the conditions of operation are imposed:

Salinity
Temperature
Humidity
Inclination
Vibration

Results of other parameters tested

Official stamp Signed
.....

Administration of

Dated this day of..... 20.....

* Delete as appropriate.
