

Subject

Requirements of MARPOL ANNEX V amended by MEPC.277(70)

ClassNK

Technical Information

No. TEC-1135
Date 20 October 2017

To whom it may concern

At the seventy session of the Marine Environment Protection Committee (MEPC 70) held on October 2016, amendments to MARPOL V was adopted and amended MARPOL V adopted by MEPC.277(70) will enter into force on 1 March 2018. Please also refer to ClassNK Technical Information No.TEC-1103 issued on 10 March 2017.

And, also, implementation guideline of MARPOL V was amended by MEPC.295(71).

By the amendment, handling procedure, management method, and record keeping method regarding garbage from ships were changed. Therefore, vessels are required to implement the followings by 1 March 2018:

1. Solid bulk cargoes other than grain shall be classified in accordance with appendix I of MEPC.277(70), and declared by the shipper as to whether or not they are harmful to the marine environment.
2. Amended form (including amendment of garbage category for the purpose of recording) of Garbage Record Book has to be kept onboard and entries shall be made in the amended form. Please refer to appendix II of MEPC.277(70).
3. Garbage is to be handled taking into account amended garbage category.

Similar to before, no statutory certificate or mandatory inspection is regulated under the MARPOL V. So far, ClassNK has done many appraisal services related to MARPOL V under voluntary basis as requested by shipowners (refer to ClassNK Technical Information No.TEC-1076). Now, we will continue this service according to the revised MARPOL V.

In case you require statement of fact according to the amended MARPOL V or examination of Garbage Management plan (including Garbage Management plan examined in accordance with existing MARPOL V), please contact the convenient ClassNK survey site with the following necessary documents.

(To be continued)

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[Required documents for the survey]

- 1) Application 1 set
- 2) Documents for the ship (Placards, Garbage Management plan and Garbage Record book) 2 sets each
- 3) Documents for reference (Specification of (e.g. equipment for the handling of garbage)) 1 set

Both examination of Garbage Management Plan and onboard inspection are required to issue the appraisal certificate. (Only examination of Garbage Management Plan can be done without onboard inspection, but in this case appraisal certificate will not be issued)

(Note)

All issued appraisal certificates relating to the existing MARPOL V do not ensure that the vessel is complying with the requirements of revised MARPOL V coming into force on 1 March 2018. The certificate format is changed for the revised MARPOL V.

For any questions about the above, please contact:

NIPPON KAIJI KYOKAI (ClassNK)

Marine and Industrial Service Department, Administration Center Annex, Head Office

Address: 3-3 Kioi-cho, Chiyoda-ku, Tokyo 102-0094, Japan

Tel.: +81-3-5226-2175

Fax: +81-3-5226-2177

E-mail: mid@classnk.or.jp

Attachment:

1. Resolution MEPC.277(70)
2. Resolution MEPC.295(71)

ANNEX 2

**RESOLUTION MEPC.277(70)
(Adopted on 28 October 2016)**

**AMENDMENTS TO THE ANNEX OF THE INTERNATIONAL CONVENTION FOR THE
PREVENTION OF POLLUTION FROM SHIPS, 1973, AS MODIFIED BY THE
PROTOCOL OF 1978 RELATING THERETO**

Amendments to MARPOL Annex V

(HME substances and Form of Garbage Record Book)

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 conferred upon it by international conventions for the prevention and control of marine pollution from ships,

NOTING article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering and adopting amendments thereto,

HAVING CONSIDERED, at its seventieth session, proposed amendments to MARPOL Annex V concerning substances that are harmful to the marine environment (HME) and Form of Garbage Record Book,

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to MARPOL Annex V, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 September 2017 unless prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 March 2018 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to MARPOL;

5 REQUESTS FURTHER the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to MARPOL.

ANNEX

**AMENDMENTS TO MARPOL ANNEX V
(HME substances and Form of Garbage Record Book)**

ANNEX V

REGULATIONS FOR THE PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

Regulation 4

Discharge of garbage outside special areas

1 In the second sentence of paragraph 1.3, the words "taking into account guidelines developed by the Organization" are replaced with the words "in accordance with the criteria set out in appendix I of this Annex".

2 A new paragraph 3 is added as follows:

"3 Solid bulk cargoes as defined in regulation VI/1-1.2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974 , as amended, other than grain, shall be classified in accordance with appendix I of this Annex, and declared by the shipper as to whether or not they are harmful to the marine environment*."

3 The existing paragraph 3 is renumbered as paragraph 4.

Regulation 6

Discharge of garbage within special areas

4 Paragraph 1.2.1 is replaced with the following:

".1 Cargo residues contained in hold washing water do not include any substances classified as harmful to the marine environment according to the criteria set out in appendix I of this Annex;"

5 A new paragraph 1.2.2 is added as follows:

".2 Solid bulk cargoes as defined in regulation VI/1-1.2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974 , as amended, other than grain, shall be classified in accordance with appendix I of this Annex, and declared by the shipper as to whether or not they are harmful to the marine environment*;"

6 A new paragraph 1.2.3 is added as follows:

".3 Cleaning agents or additives contained in hold washing water do not include any substances classified as harmful to the marine environment taking into account guidelines developed by the Organization;"

* For ships engaged in international voyages, reference is made to section 4.2.3 of the International Maritime Solid Bulk Cargoes (IMSBC) Code; for ships not engaged in international voyages, other means of declaration may be used, as determined by the Administration.

7 The existing paragraphs 1.2.2 to 1.2.4 are renumbered as paragraphs 1.2.4 to 1.2.6. The renumbered paragraph 1.2.6 is amended to read as follows:

- ".6 Where the conditions of subparagraphs .2.1 to .2.5 of this paragraph have been fulfilled, discharge of cargo hold washing water containing residues shall be made as far as practicable from the nearest land or the nearest ice shelf and not less than 12 nautical miles from the nearest land or the nearest ice shelf."

Regulation 10

Placards, garbage management plans and garbage record-keeping

8 In the chapeau of paragraph 3, the words "the appendix" is replaced with the words "appendix II".

9 Paragraph 3.2 is replaced with the following:

- ".2 The entry for each discharge into the sea under regulations 4, 5, 6 or section 5.2 of chapter 5 of part II-A of the Polar Code shall include date and time, position of the ship (latitude and longitude), category of the garbage and the estimated amount (in cubic metres) discharged. For discharge of cargo residues the discharge start and stop positions shall be recorded in addition to the foregoing;"

10 After the existing paragraph 3.2, new paragraphs 3.3 and 3.4 are inserted as follows:

- ".3 The entry for each completed incineration shall include date and time and position of the ship (latitude and longitude) at the start and stop of incineration, categories of garbage incinerated and the estimated amount incinerated for each category in cubic metres;
- .4 The entry for each discharge to a port reception facility or another ship shall include date and time of discharge, port or facility or name of ship, categories of garbage discharged, and the estimated amount discharged for each category in cubic metres;"

11 The existing paragraph 3.3 is renumbered as 3.5 and between the words "Book" and "shall", the words "along with receipts obtained from reception facilities" are inserted.

12 The existing paragraph 3.4 is renumbered as 3.6 and is replaced with the following:

- ".6 In the event of any discharge or accidental loss referred to in regulation 7 of this Annex an entry shall be made in the Garbage Record Book, or in the case of any ship of less than 400 gross tonnage, an entry shall be made in the ship's official log-book of the date and time of occurrence, port or position of the ship at time of occurrence (latitude, longitude and water depth if known), the reason for the discharge or loss, details of the items discharged or lost, categories of garbage discharged or lost, estimated amount for each category in cubic metres, reasonable precautions taken to prevent or minimize such discharge or accidental loss and general remarks."

13 A new appendix I is added as follows and the existing appendix is renumbered as appendix II:

"Appendix I

Criteria for the classification of solid bulk cargoes as harmful to the marine environment

For the purpose of this Annex, cargo residues are considered to be harmful to the marine environment (HME) if they are residues of solid bulk cargoes which are classified according to the criteria of the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) meeting the following parameters¹:

- .1 Acute Aquatic Toxicity Category 1; and/or
- .2 Chronic Aquatic Toxicity Category 1 or 2; and/or
- .3 Carcinogenicity² Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or
- .4 Mutagenicity² Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or
- .5 Reproductive Toxicity² Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or
- .6 Specific Target Organ Toxicity Repeated Exposure² Category 1 combined with not being rapidly degradable and having high bioaccumulation; and/or
- .7 Solid bulk cargoes containing or consisting of synthetic polymers, rubber, plastics, or plastic feedstock pellets (this includes materials that are shredded, milled, chopped or macerated or similar materials)."

Appendix II

Form of Garbage Record Book

14 Section 3 of the renumbered appendix II is replaced with the following:

"3 Description of the garbage

Garbage is to be grouped into categories for the purposes of recording in parts I and II of the Garbage Record Book (or ship's official log-book) as follows:

¹ The criteria are based on UN GHS. For specific products (e.g. metals and inorganic metal compounds) guidance available in UN GHS, annexes 9 and 10 is essential for proper interpretation of the criteria and classification and should be followed.

² Products that are classified for Carcinogenicity, Mutagenicity, Reproductive Toxicity or Specific Target Organ Toxicity Repeated Exposure for oral and dermal hazards or without specification of the exposure route in the hazard statement.

Part I

- A Plastics
- B Food wastes
- C Domestic wastes
- D Cooking oil
- E Incinerator ashes
- F Operational wastes
- G Animal carcasses
- H Fishing gear
- I E-waste

Part II

- J Cargo residues (non-HME)
- K Cargo residues (HME)"

15 The Record of Garbage Discharges in the renumbered appendix II is replaced with the following:

"RECORD OF GARBAGE DISCHARGES

PART I

For all garbage other than cargo residues as defined in regulation 1.2 (Definitions)

(All ships)

Ship's name	Distinctive number or letters	IMO number
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Garbage categories

A-Plastics	B-Food waste	C-Domestic wastes	D-Cooking oil
E-Incinerator ashes	F-Operational wastes	G-Animal carcasses	H-Fishing gear I-E-waste

Discharges under MARPOL Annex V regulations 4 (Discharge of garbage outside special areas), 5 (Special requirements for discharge of garbage from fixed or floating platforms) or 6 (Discharge of garbage within special areas) or chapter 5 of part II-A of the Polar Code

Date/ Time	Position of the ship (latitude/longitude) or port if discharged ashore or name of ship if discharged to another ship	Category	Estimated amount discharged		Estimated amount incinerated (m ³)	Remarks: (e.g. start/stop time and position of incineration; general remarks)	Certification/ Signature
			Into sea (m ³)	To reception facilities or to another ship (m ³)			
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Exceptional discharge or loss of garbage under regulation 7 (Exceptions)

Date/Time	Port or position of the ship (latitude/longitude and water depth if known)	Category	Estimated amount lost or discharged (m ³)	Remarks on the reason for the discharge or loss and general remarks (e.g. reasonable precautions taken to prevent or minimize such discharge or accidental loss and general remarks)	Certification/Signature
/					
:					
/					
:					

Master's signature: _____ Date: _____

PART II
For all cargo residues as defined in regulation 1.2 (Definitions)
(Ships that carry solid bulk cargoes)

Ship's name	Distinctive number or letters	IMO number
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Garbage categories

J- Cargo residues (non-HME)	K- Cargo residues (HME)
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Discharges under regulations 4 (Discharge of garbage outside special areas) and 6 (Discharge of garbage within special areas)

Date/Time	Position of the ship (latitude/longitude) or port if discharged ashore	Category	Estimated amount discharged		Start and stop positions of the ship for discharges into the sea	Certification/Signature
			Into sea (m ³)	To reception facilities or to another ship (m ³)		

/ :						
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Master's signature: _____ Date: _____"

ANNEX 21

**RESOLUTION MEPC.295(71)
(adopted on 7 July 2017)**

2017 GUIDELINES FOR THE IMPLEMENTATION OF MARPOL ANNEX V

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 conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECALLING ALSO that Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, provides regulations for the prevention of pollution by garbage from ships,

RECALLING FURTHER that, at its sixty-second session, it adopted, by resolution MEPC.201(62), the revised MARPOL Annex V, which was further amended by resolutions MEPC.216(63), MEPC.246(66), MEPC.265(68) and MEPC.277(70),

NOTING that, at its sixty-third session, it adopted, by resolution MEPC.219(63), the *2012 Guidelines for the implementation of Annex V of MARPOL 73/78* (2012 Guidelines) which were further amended by resolution MEPC.239(65),

RECOGNIZING the need to align the relevant provisions of the 2012 Guidelines with the above-mentioned amendments to MARPOL Annex V, and relevant requirements of the International Code for ships operating in polar waters (Polar Code), adopted by resolution MEPC.264(68),

HAVING CONSIDERED, at its seventy-first session, draft 2017 Guidelines for the implementation of MARPOL Annex V,

1 ADOPTS the *2017 Guidelines for the implementation of MARPOL Annex V*, the text of which is set out in the annex to this resolution;

2 INVITES Governments to take the 2017 Guidelines into account when implementing the provisions of MARPOL Annex V;

3 REVOKES the *2012 Guidelines for the implementation of MARPOL Annex V* (resolution MEPC.219(63), as amended by resolution MEPC.239(65)).

ANNEX

2017 GUIDELINES FOR THE IMPLEMENTATION OF MARPOL ANNEX V

PREFACE

The main objectives of these Guidelines are to assist:

- .1 Governments in developing and enacting domestic laws which implement MARPOL Annex V;
- .2 shipowners, ship operators, ships' crews, cargo owners and equipment manufacturers in complying with requirements set forth in MARPOL Annex V and relevant domestic laws; and
- .3 port and terminal operators in assessing the need for, and providing, adequate reception facilities for garbage generated on all types of ships. In the interest of uniformity, Governments are requested to refer to these Guidelines and related guidance¹ developed by the Organization when developing and enforcing appropriate national regulations.

1 INTRODUCTION

1.1 The revised MARPOL Annex V, which entered into force on 1 January 2013, prohibits the discharge of all types of garbage into the sea unless explicitly permitted under the Annex. These Guidelines have been developed taking into account the regulations set forth in MARPOL Annex V, as amended and are divided into the following six sections, providing a general framework based on which Governments can formulate programmes:

- .1 Introduction;
- .2 Garbage management;
- .3 Management of cargo residues of solid bulk cargoes;
- .4 Training, education and information;
- .5 Port reception facilities for garbage; and
- .6 Enhancement of compliance with MARPOL Annex V.

1.2 Under the revised MARPOL Annex V, discharge of all garbage into the sea is prohibited, except as specifically permitted in regulations 3, 4, 5 and 6 of the Annex. Annex V reverses the historical presumption that garbage may be discharged into the sea based on the nature of the garbage and defined distances from shore. Regulation 7 provides limited exceptions to these regulations in emergency and non-routine situations. Generally, discharge is restricted to food wastes, identified cargo residues, animal carcasses, identified cleaning agents and additives, and cargo residues entrained in washwater which are not harmful to the marine environment. It is recommended that ships use port reception facilities as the primary means of discharge for all garbage.

¹ Port Reception Facilities – How to do it, 2016 Edition; *Guidelines for ensuring the adequacy of port waste reception facilities* (resolution MEPC.83(44)); *Consolidated guidance for port reception facility providers and users* (MEPC.1/Circ.834).

1.3 Recognizing that MARPOL Annex V regulations continue to restrict the discharge of garbage into the sea and require garbage management for ships, and that garbage management technology continues to evolve, it is recommended that Governments and the Organization continue to gather information and review these Guidelines periodically.

1.4 Regulation 8 of MARPOL Annex V provides that Governments must ensure the provision of adequate port reception facilities for garbage from ships and should facilitate and promote their use. Section 5 provides guidelines for these facilities.

1.5 MARPOL Annex V provides definitions for terms used throughout these Guidelines. Section 1.6 includes relevant aspects of these definitions, followed by other definitions which are useful for these Guidelines.

1.6 Definitions

1.6.1 *Dishwater* means the residue from the manual or automatic washing of dishes and cooking utensils which have been pre-cleaned to the extent that any food particles adhering to them would not normally interfere with the operation of automatic dishwashers.

1.6.2 *E-waste* means electrical and electronic equipment used for the normal operation of the ship or in the accommodation spaces, including all components, subassemblies and consumables, which are part of the equipment at the time of discarding, with the presence of material potentially hazardous to human health and/or the environment.

1.6.3 *Grey water* means drainage from dishwater, shower, laundry, bath and washbasin drains. It does not include drainage from toilets, urinals, hospitals and animal spaces, as defined in regulation 1.3 of MARPOL Annex IV (sewage) and drainage from cargo spaces. Grey water is not considered garbage in the context of MARPOL Annex V.

1.6.4 *Recycling* means the activity of segregating and recovering components and materials for reprocessing.

1.6.5 *Reuse* means the activity of recovering components and materials for further use without reprocessing.

1.7 Application

1.7.1 This section provides clarification as to what should and should not be considered as garbage under MARPOL Annex V.

1.7.2 Ash and clinkers from shipboard incinerators and coal-burning boilers should be considered as operational wastes within the meaning of regulation 1.12 of MARPOL Annex V, and therefore are included in the term "garbage", within the meaning of regulation 1.9 of MARPOL Annex V.

1.7.3 The definition of "operational wastes" (regulation 1.12 of MARPOL Annex V) excludes grey water, bilge water and other similar discharges essential to the operation of a ship. "Other similar discharges" essential to the operation of a ship include, but are not limited to, the following:

- .1 boiler/economizer blowdown;
- .2 boat engine wet exhaust;

- .3 chain locker effluent;
- .4 controllable pitch propeller and thruster hydraulic fluid and other oil to sea interfaces (e.g. thruster bearings, stabilizers, rudder bearings, etc.);
- .5 distillation/reverse osmosis brine;
- .6 elevator pit effluent;
- .7 firemain systems water;
- .8 freshwater lay-up;
- .9 gas turbine washwater;
- .10 motor gasoline and compensating discharge;
- .11 machinery wastewater;
- .12 pool, spa water and recreational waters;
- .13 sonar dome discharge; and
- .14 welldeck discharges.

1.7.4 While cleaning agents and additives contained in hold washwater and deck and external surface washwater are considered "operational wastes" and thus "garbage" under MARPOL Annex V, these cleaning agents and additives may be discharged into the sea so long as they are not harmful to the marine environment.

1.7.5 A cleaning agent or additive is considered not harmful to the marine environment if it:

- .1 is not a "harmful substance" in accordance with the criteria in MARPOL Annex III; and
- .2 does not contain any components which are known to be carcinogenic, mutagenic or reprotoxic (CMR).

1.7.6 The ship's record should contain evidence provided by the producer of the cleaning agent or additive that the product meets the criteria for not being harmful to the marine environment. To provide an assurance of compliance, a dated and signed statement to this effect from the product supplier would be adequate for the purposes of a ship's record. This might form part of a Safety Data Sheet or be a stand-alone document, but this should be left to the discretion of the producer concerned.

1.7.7 Releasing small quantities of food into the sea for the specific purpose of fish feeding in connection with fishing or tourist operations should not be considered as discharge of garbage in the context of MARPOL Annex V.

1.7.8 Fishing gear that is released into the water with the intention of later retrieval, such as fish aggregating devices (FADs), traps and static nets, should not be considered garbage or accidental loss in the context of MARPOL Annex V.

2 GARBAGE MANAGEMENT

2.1 Waste minimization

2.1.1 All shipowners and operators should minimize taking onboard material that could become garbage. Ship-specific garbage minimization procedures should be included in the Garbage Management Plan. It is recommended that manufacturers, cargo owners, ports and terminals, shipowners and operators and Governments consider the management of garbage associated with ships' supplies, provisions, and cargoes as needed to minimize the generation of garbage in all forms.

2.1.2 When making supply and provisioning arrangements, shipowners and operators, where possible with the ships' suppliers, should consider the products being procured in terms of the garbage they will generate. Options that should be considered to decrease the amount of such garbage include the following:

- .1 using supplies that come in bulk packaging, taking into account factors such as adequate shelf-life (once a container is open) to avoid increasing garbage associated with such products;
- .2 using supplies that come in reusable or recyclable packaging and containers; avoiding the use of disposable cups, utensils, dishes, towels and rags and other convenience items whenever possible; and
- .3 avoiding supplies that are packaged in plastic, unless a reusable or recyclable plastic is used.

2.1.3 When considering selection of materials for stowage and securing of cargo or protection of cargo from the weather, shipowners and operators should consider how much garbage such materials will generate. Options that should be considered to decrease the amount of such garbage include the following:

- .1 using permanent reusable coverings for cargo protection instead of disposable or recyclable plastic sheeting;
- .2 using stowage systems and methods that reuse dunnage, shoring, lining and packing materials; and
- .3 discharging to port reception facilities the dunnage, lining and packaging materials generated in port during cargo activities as their discharge into the sea is not permitted.

2.1.4 Governments are encouraged to undertake research and technology development to minimize potential garbage and its impacts on the marine environment. Suggested areas for such study are listed below:

- .1 development of recycling technology and systems for all types of materials that may be returned to shore as garbage; and

- .2 development of technology for use of biodegradable materials to replace current plastic products as appropriate. In connection with this, governments should also study the impacts on the environment of the products from degradation of such new materials.

2.2 Fishing gear

2.2.1 Lost fishing gear may harm the marine environment or create a navigation hazard. Fishing vessel operators are required to record the discharge or loss of fishing gear in the Garbage Record Book or the ship's official log-book as specified in regulations 7.1 and 10.3.6 of MARPOL Annex V.

2.2.2 Fishing vessel operators are further required to report the accidental loss or discharge of fishing gear which poses a significant threat to the marine environment and navigation. Reports should be made to the flag State, and where appropriate, the coastal State in whose jurisdiction the loss of the fishing gear occurred, as specified in regulation 10.6 of MARPOL Annex V:

- .1 the accidental loss or discharge of fishing gear which is required to be reported by regulation 10.6 of MARPOL Annex V should be determined specifically by the government. For such determination, the government is encouraged to consider various factors including: (1) the amount of the gear lost or discharged and (2) the conditions of the marine environment where it was lost or discharged. Comprehensive consideration is needed on the characteristics of the gear that was lost, including types, size (weight and/or length), quantity, material (especially, synthetic/plastic or not), buoyancy. In addition, governments should consider the impact of the fishing gear in different locations in order to assess whether the lost gear represents a significant threat to the marine environment or navigation, taking into account the vulnerability of habitat and protected species to gear interactions. Governments are encouraged to report to the Organization measures taken to address this issue, with a view to promoting information sharing and opinion exchange among Governments and relevant international organizations. Further, Governments are encouraged to report to the Organization progress made in implementing these measures, including summaries of where gear was lost and, if applicable, actions taken to address the gear loss;
- .2 examples of lost or abandoned fishing gear which could be considered to pose a significant threat to the marine environment include whole or nearly whole large fishing gear or other large portions of gear. In determining the threat to the marine environment, Governments should give careful consideration to the impact of gear in sensitive areas, such as coral reefs, and in areas where interactions would have higher risks of detrimental impacts, such as foraging or breeding areas for protected species;
- .3 Governments are encouraged to develop communication frameworks to enable the recording and sharing of information on fishing gear loss where necessary in order to reduce loss and facilitate recovery of fishing gear. Governments are further encouraged to develop frameworks to assist fishing vessels in reporting the loss of gear to the flag State and to a coastal State. Such frameworks should take into consideration implementation challenges in small scale and artisanal fisheries and recreational operations;

- .4 fishing industry, relevant international organizations and Governments are encouraged to undertake such research, technology development, information sharing and management measures as may be needed to minimize the probability of loss, and maximize the probability of retrieval of fishing gear from the sea; and
- .5 Governments should encourage vessel operators to implement appropriate onboard storage and handling of fishing gear, and should also consider relevant guidance issued by FAO and IMO.

2.3 Shipboard garbage handling (collection, processing, storage, discharge)

2.3.1 Regulation 3 of MARPOL Annex V provides that the discharge of garbage into the sea is prohibited, with limited exceptions, as summarized in table 1. Under certain conditions discharge into the sea of food wastes, animal carcasses, cleaning agents and additives contained in hold washwater, deck and external surface washwater and cargo residues which are not considered to be harmful to the marine environment is permitted.

Table 1: Summary of restrictions to the discharge of garbage into the sea under regulations 4, 5, 6 and 14 of MARPOL Annex V and chapter 5 of part II-A of the Polar Code

(Note: Table 1 is intended as a summary reference. The provisions in MARPOL Annex V and the Polar Code, not table 1, prevail.)

Garbage type ¹	All ships except platforms ⁴		Offshore platforms located more than 12 nm from nearest land and ships when alongside or within 500 metres of such platforms ⁴ Regulation 5
	Outside special areas and Arctic waters Regulation 4 (Distances are from the nearest land)	Within special areas and Arctic waters Regulation 6 (Distances are from nearest land, nearest ice-shelf or nearest fast ice)	
Food waste comminuted or ground ²	≥3 nm, en route and as far as practicable	≥12 nm, en route and as far as practicable ³	Discharge permitted
Food waste not comminuted or ground	≥12 nm, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues ^{5, 6} not contained in washwater	≥ 12 nm, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues ^{5, 6} contained in washwater		≥ 12 nm, en route and as far as practicable (subject to conditions in regulation 6.1.2 and paragraph 5.2.1.5 of part II-A of the Polar Code)	
Cleaning agents and additives ⁶ contained in cargo hold washwater	Discharge permitted	≥ 12 nm, en route and as far as practicable (subject to conditions in regulation 6.1.2 and paragraph 5.2.1.5 of part II-A of the Polar Code)	Discharge prohibited
Cleaning agents and additives ⁶ in deck and external surfaces washwater		Discharge permitted	
Animal Carcasses (should be split or otherwise treated to ensure the	Must be en route and as far from the nearest land as possible. Should be >100 nm	Discharge prohibited	Discharge prohibited

Garbage type ¹	All ships except platforms ⁴		Offshore platforms located more than 12 nm from nearest land and ships when alongside or within 500 metres of such platforms ⁴ Regulation 5
	Outside special areas and Arctic waters Regulation 4 (Distances are from the nearest land	Within special areas and Arctic waters Regulation 6 (Distances are from nearest land, nearest ice-shelf or nearest fast ice)	
carcasses will sink immediately)	and maximum water depth		
All other garbage including plastics, synthetic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse	Discharge prohibited	Discharge prohibited	Discharge prohibited

- ¹ When garbage is mixed with or contaminated by other harmful substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply.
- ² Comminuted or ground food wastes must be able to pass through a screen with mesh no larger than 25 mm.
- ³ The discharge of introduced avian products in the Antarctic area is not permitted unless incinerated, autoclaved or otherwise treated to be made sterile. In polar waters, discharge shall be made as far as practicable from areas of ice concentration exceeding 1/10; in any case food wastes shall not be discharged onto the ice.
- ⁴ Offshore platforms located 12 nm from nearest land and associated ships include all fixed or floating platforms engaged in exploration or exploitation or associated processing of seabed mineral resources, and all ships alongside or within 500 m of such platforms.
- ⁵ Cargo residues means only those cargo residues that cannot be recovered using commonly available methods for unloading.
- ⁶ These substances must not be harmful to the marine environment.

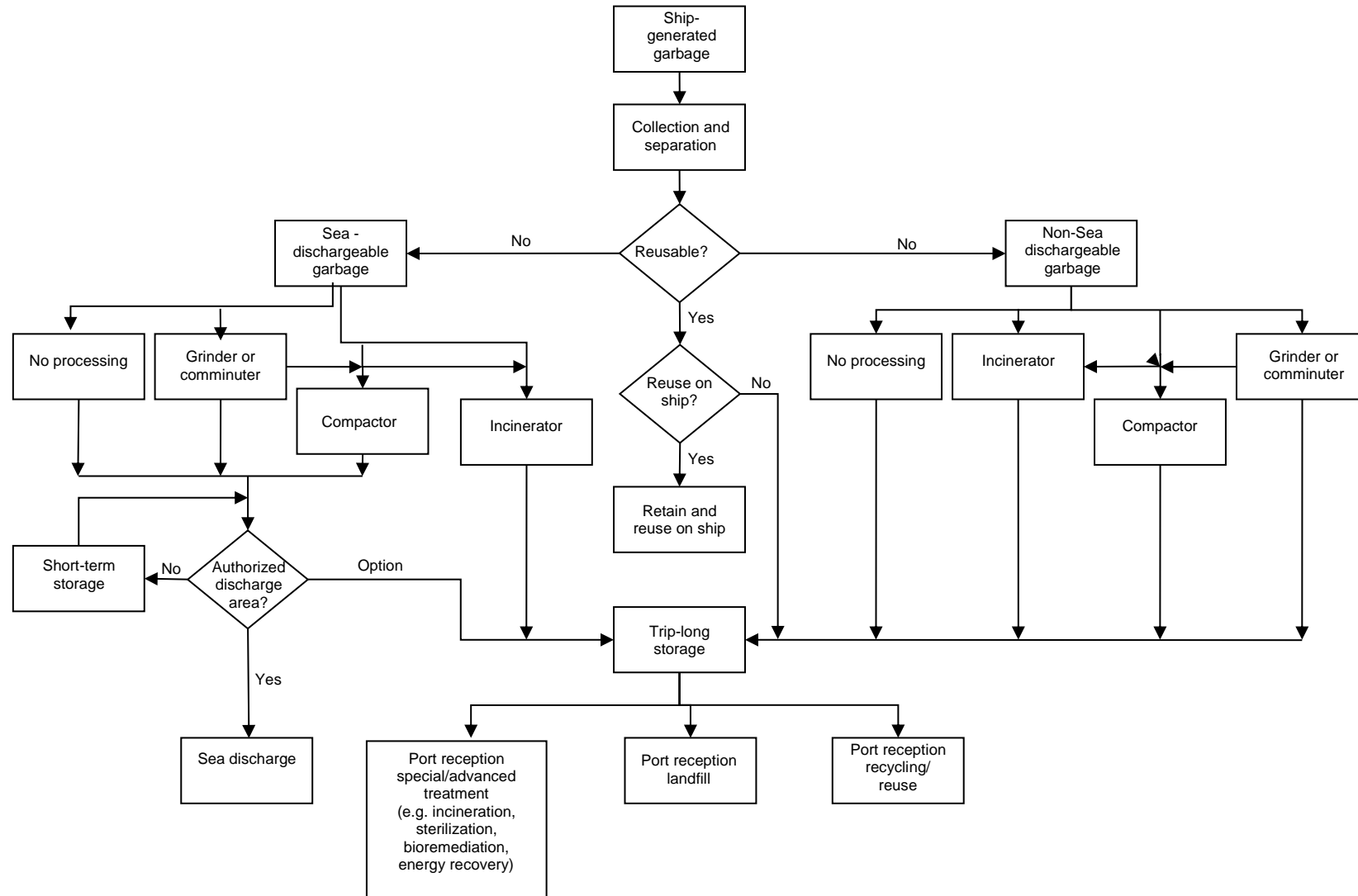
2.3.2 Compliance with MARPOL Annex V involves personnel, equipment and procedures for collecting, sorting, processing, storing, recycling, reusing and discharging garbage. Economic and procedural considerations associated with these activities include storage space requirements, sanitation, equipment and personnel costs and in port garbage service charges.

2.3.3 Compliance with the provisions of MARPOL Annex V involves careful planning by the ship's owner and operator and proper execution by crew members as well as other seafarers. The most appropriate procedures for handling and storing garbage on board ships may vary depending on factors such as the type and size of the ship, the area of operation (e.g. special area, distance from nearest land, ice-shelf or fast ice), shipboard garbage processing equipment and storage space, number of crew or passengers, duration of voyage, and regulations and reception facilities at ports of call. However, in view of the cost involved with the different garbage handling options, it is economically advantageous to first, limit the amount of material that may become garbage from being brought on board the ship and second, separate garbage eligible for discharge into the sea from other garbage that may not be discharged into the sea. Proper management of containers and packaging coming on board and proper handling and storage can minimize shipboard storage space requirements and enable efficient transfer of retained garbage to port reception facilities for proper handling (i.e. recycling, reuse) or land-based disposal.

2.3.4 Every ship of 100 gross tonnage and above every ship certified to carry 15 or more persons and fixed and floating platforms are required to carry and implement a garbage management plan that specifies procedures to be followed to ensure proper and efficient handling and storage of garbage. A garbage management plan² should be developed that can be incorporated in crew and ship operating manuals. Such manuals should identify crew responsibilities (including an Environmental Control Officer) and procedures for all aspects of handling and storing garbage on board the ship. Procedures for handling ship-generated garbage are divided into four phases: collection, processing, storage and discharge. A generalized garbage management plan for handling and storing ship-generated garbage is presented in table 2. Specific procedures for each phase are discussed below.

² Garbage management plans are mandatory on certain ships in accordance with regulation 10 of MARPOL Annex V.

Table 2: Options for shipboard handling and discharge of garbage



2.4 Collection

2.4.1 Procedures for collecting garbage generated on board should be based on the consideration of what is permitted and what is not permitted to be discharged into the sea while en route, and whether a particular garbage type can be discharged to port facilities for recycling or reuse. The details of these procedures should be written in the garbage management plan.

2.4.2 To reduce or avoid the need for sorting after collection and to facilitate recycling, it is recommended that distinctively marked garbage receptacles be provided on board the ship to receive garbage as it is generated. Receptacles on board can be in the form of drums, metal bins, cans, container bags or wheelie bins. Any receptacles on deck areas, poop decks or areas exposed to the weather should be secured on the ship and have lids that are tight and securely fixed. All garbage receptacles should be secured to prevent loss, spillage, or loss of any garbage that is deposited in the receptacles. Receptacles should be clearly marked and distinguishable by graphics shape, size or location. Receptacles should be placed in appropriate spaces throughout the ship (e.g. the engine-room, mess deck, wardroom, galley and other living or working spaces) and all crew members and passengers should be advised of what garbage should and should not be placed in them.

2.4.3 The recommended garbage types that should be separated are:

- .1 non-recyclable plastics and plastics mixed with non-plastic garbage;
- .2 rags;
- .3 recyclable material:
 - .1 cooking oil;
 - .2 glass;
 - .3 aluminium cans;
 - .4 paper, cardboard, corrugated board;
 - .5 wood;
 - .6 metal; and
 - .7 plastics; (including styrofoam or other similar plastic material);
- .4 E-waste generated on board (e.g. electronic cards, gadgets, instruments, equipment, computers, printer cartridges, etc.); and
- .5 garbage that might present a hazard to the ship or crew (e.g. oily rags, light bulbs, acids, chemicals, batteries, etc.).

2.4.4 Crew responsibilities should be assigned for collecting or emptying these receptacles and taking the garbage to the appropriate processing or storage location. Use of such a system facilitates subsequent shipboard processing and minimizes the amount of garbage which must be stored on board ship for return to port.

Plastics and plastics mixed with non-plastic garbage

2.4.5 Plastics are used for a variety of marine purposes including, but not limited to, packaging (vapour-proof barriers, bottles, containers, liners, bags, cargo wrapping material,

foam cushioning material, etc.); ship construction (fibreglass and laminated structures, siding, piping, insulation, flooring, carpets, fabrics, paints and finishes, adhesives, electrical and electronic components, etc.); disposable eating utensils (styrofoam plates, bowls, food containers, cups, etc.); bags; sheeting; floats; fishing nets; fishing lines; strapping bands; wire rope with synthetic fibre sheaths; combination wire rope; rope; line; sails; and many other manufactured plastic items.

2.4.6 Regulation 3.2 of MARPOL Annex V prohibits the discharge of all plastics into the sea. When plastic is mixed with other garbage, the mixture must be treated as if it were all plastic. The most stringent procedures for the handling and discharge should be followed taking into account the applicable provisions of the garbage management plan.

Food wastes

2.4.7 Some Governments have regulations for controlling human, plant and animal diseases that may be carried by foreign food wastes and materials that have been associated with them (e.g. food packing and disposable eating utensils, etc.). These regulations may require incinerating, sterilizing, double bagging or other special treatment of garbage to destroy possible pest and disease organisms. This type of garbage should be kept separate from other garbage and preferably retained for discharge at port reception facilities in accordance with the laws of the receiving country. Governments are reminded of their obligation to ensure the provision of adequate reception facilities. Precautions should be taken to ensure that plastics contaminated by food wastes (e.g. plastic food wrappers) are not discharged into the sea with other food wastes.

Synthetic fishing net and line scraps

2.4.8 As regulation 3.2 of MARPOL Annex V prohibits the discharge into the sea of synthetic fishing nets and line scraps generated by the repair or operation of fishing gears, these items should be collected in a manner that avoids their loss overboard. Such material may be incinerated, compacted or stored along with other plastics or it may be preferable to keep it separate from other types of garbage if it has strong odour or is present in great volume. Unless such garbage is appropriately incinerated, the atmospheric incineration products could be toxic. Onboard incineration should follow regulation 16 of MARPOL Annex VI.

Recovery of garbage at sea

2.4.9 Seafarers are encouraged to recover persistent garbage from the sea during routine operations as opportunities arise and prudent practice permits and to retain the material for discharge to port reception facilities.

2.5 Processing

2.5.1 Depending on factors such as the type of ship, area of operation, number of crew or passengers, etc., ships may be equipped with incinerators³, compactors, comminuters or other devices for shipboard garbage processing (see sections 2.8 to 2.11). Appropriate members of the crew should be trained and assigned responsibility for operating this equipment on a schedule commensurate with ship needs. In selecting appropriate processing procedures, the following should be considered.

2.5.2 Use of compactors, incinerators, comminuters and other such devices has a number of advantages, such as reducing shipboard space requirements for storing garbage and making it easier to discharge garbage at port reception facilities.

³ Refer to the 2014 Standard specification for shipboard incinerators (resolution MEPC.244(66)).

2.5.3 It should be noted that special rules on incineration under domestic law may apply in some ports and may exist in some special areas. Incineration of hazardous materials (e.g. scraped paint, impregnated wood) and certain types of plastics (e.g. PVC-based plastics or other plastics containing hazardous chemicals) calls for special precaution due to the potential environmental and health effects from combustion of by-products. The problems of combustion of by-products are discussed in 2.11.3.

2.5.4 Ships operating primarily in special areas, Arctic waters or within 3 nm from the nearest land, ice-shelf or fast ice are greatly restricted in what they can discharge. These ships should choose between storage of either compacted or uncompacted material for discharging at port reception facilities or incineration with retention of ash and clinkers. The type of ship and the expected volume and type of garbage generated determine the suitability of compaction, incineration or storage options.

2.6 Storage

Garbage collected throughout the ship should be delivered to designated processing or storage locations. Garbage that must be returned to port for discharge at port reception facilities may require storage until arrangements can be made to discharge it ashore for appropriate processing. In all cases, garbage should be stored in a manner which avoids health and safety hazards. The following points should be considered when selecting procedures for storing garbage:

- .1 sufficient storage space and equipment (e.g. cans, drums, bags or other containers) should be provided. Where storage space is limited, ship operators are encouraged to consider the installation of compactors or incinerators. To the extent possible, all processed and unprocessed garbage stored for any length of time should be in tight, securely covered containers in order to prevent the unintentional discharge of stored garbage;
- .2 food wastes and other garbage to be returned to port and which may carry diseases or pests should be stored in tightly covered containers and be kept separate from garbage which does not contain such food wastes. Quarantine arrangements in some countries may require double bagging of this type of waste. Both types of garbage should be stored in separate clearly marked containers to avoid incorrect discharge and facilitate proper handling and treatment on land; and
- .3 cleaning and disinfecting are both preventative and remedial pest control methods that should be applied regularly in garbage storage areas.

2.7 Discharge

Although discharge into the sea of limited types of garbage is permitted under MARPOL Annex V, discharge of garbage to port reception facilities should be given primary consideration. When discharging garbage, the following points should be considered:

- .1 regulations 4, 5, and 6 of MARPOL Annex V and chapter 5 of part II-A of the Polar Code, summarized in table 1, set forth the requirements for garbage permitted to be discharged into the sea. In general the discharge shall take place when the ship is en route and as far as practicable from the nearest land, ice shelf or fast ice. Attempts should be made to spread the discharge over as wide an area as possible and in deep water (50 m or more). Prevailing currents and tidal movements should be taken into consideration when discharging into the sea is permitted; and

- .2 to ensure timely transfer of large quantities of ship-generated garbage to port reception facilities, it is essential for shipowners, operators or their agents to make arrangements well in advance for garbage reception. At the same time, discharge needs should be identified in order to make arrangements for garbage requiring special handling or other necessary arrangements. Advice should be provided to the port of the type of garbage to be discharged and whether it is separated and the estimated amounts. The port may have special discharge requirements for food wastes and related garbage which may carry certain disease or pest organisms, dunnage, batteries, medicines, outdated pyrotechnics or unusually large, heavy or odorous derelict fishing gear, etc.

2.8 Shipboard equipment for processing garbage

The choice of options⁴ for garbage processing depends largely upon personnel limitations, generation rate, capacity, ship configuration, voyage route and availability of port reception facilities. The type of equipment available for shipboard garbage handling includes incinerators, compactors, comminuters and their associated hardware.

2.9 Grinding or comminution

2.9.1 The discharge of comminuted food wastes may be permitted under regulations 4.1.1 and 6.1.1 of MARPOL Annex V or paragraph 5.2.1 of part II-A of the Polar Code whilst the ship is en route. Such comminuted or ground food wastes must be capable of passing through a screen with openings no greater than 25 mm.

2.9.2 A wide variety of food waste grinders is available on the market and most modern ships' galleys have the equipment needed to produce a slurry of food particles and water that washes easily through the required 25 mm screen. Output ranges from 10 to 250 litres per minute. The discharge from shipboard comminuters should be directed into an appropriately constructed holding tank when the ship is operating within an area where discharge is prohibited.

2.9.3 Size reduction of certain other garbage items can be achieved by shredding or crushing and machines for carrying out this process are available for use on board ships.

2.9.4 Information on the development, advantages and use of comminuters for processing food waste aboard ships should be forwarded to the Organization for sharing between interested parties.

2.9.5 Outside special areas and Arctic waters, ships operating primarily beyond 3 nm from the nearest land are encouraged to install and use comminuters to grind food wastes to a particle size capable of passing through a screen with openings no larger than 25 mm. Regulation 4 of MARPOL Annex V requires comminuting or grinding food wastes if the food wastes are to be discharged between three and 12 nm from the nearest land. Although unprocessed food wastes may be discharged beyond 12 nm, it is recommended that comminuters be used as they hasten assimilation into the marine environment. Because food wastes comminuted with plastics cannot be discharged into the sea, all plastic materials need to be removed before food wastes are placed into a comminuter or grinder.

⁴ Reference may also be made to other technical guidance such as, ISO/CD21070: *Ships and marine technology – Marine environment protection – Management and handling of shipboard garbage*.

2.9.6 When operating inside a special area or Arctic waters, regulation 6 of MARPOL Annex V and chapter 5 of part II-A of the Polar Code require all food wastes to be comminuted or ground prior to discharge into the sea. All discharges are to be as far as practicable and not less than 12 nm from the nearest land, ice-shelf or fast ice. Food wastes shall not be discharged onto the ice.

2.10 Compaction

Table 3 shows compaction options for various types of garbage.

Table 3: Compaction options for shipboard-generated garbage

Examples of garbage	Special handling by ship's personnel before compaction	Compaction characteristics			Onboard storage space
		Rate of alteration	Retainment of compacted form	Density of compacted form	
Metal, food and beverage containers, glass, small wood pieces	None	Very rapid	Almost 100%	High	Minimum
Comminuted plastics, fibre and paper board	Minor – reduce material to size for feed, minimal manual labour	Rapid	Approximately 80%	Medium	Minimum
Small metal drums ⁵ , uncomminuted cargo packing, large pieces of wood	Moderate – longer manual labour time required to size material for feed	Slow	Approximately 50%	Relatively low	Moderate
Uncomminuted plastics	Major – very long manual labour time to size material for feed; usually impractical	Very slow	Less than 10%	Very low	Maximum
Bulky metal cargo containers, thick metal items	Impractical for shipboard compaction; not feasible	Not applicable	Not applicable	Not applicable	Maximum

2.10.1 Most garbage can be compacted to some degree; the exceptions include unground plastics, fibre and paperboard, bulky cargo containers and thick metal items. Pressurized containers should not be compacted or shredded without the use of specialized equipment designed for this purpose because they present an explosion hazard in standard compactors.

⁵ Small and large drums can be compacted very easily with the proper device – a large number of these devices have been designed for remote locations, and therefore they are small and easy to operate with excellent results. It should be noted, that the compaction of drums is probably restricted to larger vessels, due to lack of space on smaller (fishing) vessels.

2.10.2 Compaction reduces the volume of garbage. In most cases, the output from a compactor is a block of material which facilitates the shipboard storage of garbage and its discharging in a port facility. It should be taken into account that the output from a compactor might be subject to quarantine, sanitary or health requirements or other requirements from the port reception facilities and advice from local authorities should be sought on any standards or requirements which are additional to those set by the Organization.

2.10.3 Compactors have options including sanitizing, deodorizing, adjustable compaction ratios, bagging in plastic or paper, boxing in cardboard (with or without plastic or wax paper lining), baling, etc. Compacted materials should be stored appropriately. While metal and plastic bales can get wet, paper and cardboard bales should be kept dry.

2.10.4 If grinding machines are used prior to compaction, the compaction ratio can be increased and the storage space decreased. Careful investigation of the appropriate compaction machine should be undertaken, based on the type and volume of material that will be compacted, as not all compactors require grinding. Compaction is just one step in the solid waste management scheme and the shipowner/operator should ensure all phases of garbage management are described in their Garbage Management Plan. Proper care should be taken when handling and storing binder wrap to prevent it from accidentally entering the marine environment.

2.10.5 A compactor should be installed in a compartment with adequate room for operating and maintaining the unit and storing garbage to be processed. The compartment should be located adjacent to the areas of food processing and commissary store-rooms. If not already required by regulation, it is recommended that the space should have freshwater wash down service, coamings, deck drains, adequate ventilation and hand or automatic fixed fire-fighting equipment.

2.10.6 Information on the development and use of shipboard compactors should be forwarded to the Organization for sharing between interested parties.

2.11 Incineration

2.11.1 Ash and clinkers from shipboard incinerators should be considered as operational waste and, therefore, as garbage that is not eligible for discharge into the sea.

2.11.2 Incineration conducted in a shipboard incinerator can significantly reduce the need to store garbage on board the ship. Shipboard incinerators should be designed, constructed, operated and maintained in accordance with the *2014 Standard specification for shipboard incinerators* (resolution MEPC.244(66), as amended). MARPOL Annex VI requires shipboard incinerators installed after 1 January 2000 to be type-approved and meeting specific air pollution criteria. Incinerators should only be used to incinerate materials that are specified by the incinerator manufacturer.

2.11.3 In general, shipboard incineration should not be undertaken when the ship is in port or at an offshore terminal. Some ports may have domestic laws that specify additional air emission restrictions, particularly those near high population areas. The use of a shipboard incinerator may require permission from the port authority concerned.

2.11.4 Table 4 presents options for incineration of garbage and includes considerations for special handling by ship's personnel, combustibility, reduction in volume, residual materials, exhaust, and onboard storage space. Most garbage is amenable to incineration, with the exception of metal and glass.

Table 4: Incineration options for shipboard-generated garbage

Examples of garbage	Special handling by ship's personnel ⁶ before incineration	Incineration characteristics				Onboard storage space
		Combustibility	Reduction of volume	Residual	Exhaust	
Paper packing, food and beverage containers	Minor – easy to feed into hopper	High	Over 95%	Powder ash	Possibly smoky and not hazardous	Minimum
Fibre and paperboard	Minor – reduce material to size for feed, minimum manual labour	High	Over 95%	Powder ash	Possibly smoky and not hazardous	Minimum
Plastics packaging, food and beverage containers, etc.	Minor – easy to feed into hopper	High	Over 95%	Powder ash	Possibly smoky and not hazardous based on incinerator design	Minimum
Plastics sheeting, netting, rope and bulk material.	Moderate – manual labour time to size reduction	High	Over 95%	Powder ash	Possibly smoky and not hazardous based on incinerator design	Minimum
Rubber hoses and bulk pieces	Major – manual labour time to size reduction	High	Over 95%	Powder ash	Possibly smoky and not hazardous based on incinerator design	Minimum
Metal food and beverage containers, etc.	Minor – easy to feed into hopper	Low	Less 10%	Slag	Possibly smoky and not hazardous	Moderate
Metal cargo, bulky containers, thick metal items	Major – manual labour time to size reduction(not easily incinerated)	Very low	Less 5%	Large metal Fragments and slag	Possibly smoky and not hazardous	Maximum
Glass food and beverage containers, etc.	Minor – easy to feed into hopper	Low	Less 10%	Slag	Possibly smoky and not hazardous	Moderate
Wood, cargo containers and large wood scrapes	Moderate – manual labour time to size reduction	High	Over 95%	Powder ash	Possibly smoky and not hazardous	Minimum

⁶ Each operator of the onboard garbage incinerator should be trained and familiar in the use of the equipment and the types of garbage that can be destroyed in the incinerator.

2.11.5 Some of the disadvantages of incinerators may include the possible hazardous nature of the ash or vapour, dirty operation, excessive labour required for charging, stoking and ash removal. Some incinerators may not be able to meet air pollution regulations imposed in some ports and harbours or by flag and coastal States when such matters are subject to their jurisdiction. Some of these disadvantages can be remedied by automatic equipment for charging and stoking, however, the additional equipment to perform automatic functions will require more installation space.

2.11.6 The incineration of garbage that contains a large amount of plastic involves very specific incinerator settings such as higher oxygen injection and higher temperatures (850 to 1,200°C). If these special conditions are not met, depending on the type of plastic and conditions of combustion, some toxic gases can be generated in the exhaust stream, including vaporized hydrochloric (HCl) and hydrocyanic (HCN) acids. These and other intermediary products of combustion of waste containing plastics are toxic to humans and marine life.

2.11.7 Onboard incineration of garbage may reduce the volume of garbage subject to quarantine requirements in some countries. However, incinerator ash may still be subject to local quarantine, sanitary or health requirements. Advice should be sought from local authorities regarding requirements additionally to MARPOL. For example, higher temperatures and more complete combustion may be required to effectively destroy organisms that present a risk.

2.11.8 Information on the development and advantages on the use of shipboard incinerator systems should be forwarded to the Organization for sharing between interested parties.

2.12 Treatment of animal carcasses

2.12.1 Only fit and healthy animals should be presented for loading as cargo and managed in accordance with international standards for the transport of animals at sea⁷. The master of the ship is expected to have responsibility for shipboard livestock operational issues, animal health and welfare, and conditions for the control and reporting of animal mortality on board.

2.12.2 Ships carrying live animal cargo consignments are expected to have animals dying during a voyage. These mortalities accrue gradually over the voyage and are dependent on various factors including age and type of animal species, facilities on board the ship and local climatic conditions. The most common mortality causes stem from enteritis, refusal to feed, injury, exhaustion or illness not evident prior to loading. The mortality numbers are generally low and are operational issues to be controlled as part of cargo management practice. These mortalities are considered to be generated during the normal operation of the ship and liable to be discharged continually or periodically and therefore subject to MARPOL Annex V regulations.

2.12.3 As part of normal livestock ship management procedures, regular inspections (day and night) are recommended to ensure the health and welfare of the animals. It is recommended that these inspections include shipboard recording, on a daily basis, of the number of animals that have died or have been euthanized.

2.12.4 When mortalities occur on board, the carcasses should be removed from the pen areas and assessed for appropriate disposition. The options for appropriate discharge of the carcasses under MARPOL Annex V will typically be discharge into the sea or discharge to a reception facility. Where the ship has an appropriate storage area on board, limited quantities

⁷ The World Organisation for Animal Health (OIE) formulated "Guidelines for the Transport of Animals by Sea" as part of the Terrestrial Animal Health Code (2010).

of treated carcasses may be stored for short periods for subsequent discharge into the sea or to reception facilities. Any storage on board should take into account occupational health and safety requirements.

2.12.5 Regulation 4.1.4 of MARPOL Annex V permits the discharge into the sea of animal carcasses generated during the normal operation of a ship, but only if the ship is en route, outside a special area and Arctic waters, as far as possible from the nearest land and taking into account the guidelines developed by the Organization. To comply with regulation 4.1.4 of MARPOL Annex V, it is recommended that the discharge into the sea should take place more than 100 nm from the nearest land and in the maximum water depth possible.

2.12.6 When a ship is on a voyage that is not often more than 100 nm from nearest land, the retention of carcasses on board during conditions of high temperatures and high humidity may constitute a threat to human health and safety or to the remaining live animals. In these circumstances it may not be possible to discharge animal carcasses in accordance with these Guidelines. In such circumstances, where the master of the ship determines that such health and safety threats exist, it is recommended the discharge into the sea should take place more than 12 nm from the nearest land. Where the discharge of animal carcasses at sea occurs under these circumstances, the entry in the Garbage Record Book of the position of the ship should also include a remark about these circumstances.

2.12.7 Animal carcasses should be split or otherwise treated prior to their discharge into the sea. Procedures for the treatment of carcasses should take into account the health and safety of the crew and other livestock cargo. Treatment should facilitate the sinking or dispersal of the carcass when it is discharged into the sea.

2.12.8 Treatment of a carcass involves:

- .1 manually slitting or cutting the carcass to the extent that the thoracic and abdominal cavities are opened; or
- .2 passing the carcass through equipment such as a comminuter, grinder, hogger or mincer.

2.12.9 For each animal carcass incinerated, discharged into the sea or discharged to a reception facility, an entry in the Garbage Record Book shall be made. The entry should include the date/time, position of the ship and remarks to specify the animal species (e.g. sheep, cattle, goats), the category "G" and the number of carcasses discharged. Where the discharge is to a reception facility, the receipt obtained from the facility should be attached to the Garbage Record Book.

2.12.10 Following the completion of a voyage, the master of the ship is encouraged to provide a copy of the pages of the Garbage Record Book that contain the entries for the discharges of animal carcasses into the sea to the flag State and the State from whose port the voyage originated, and other information requested.

2.12.11 Governments are encouraged to analyse the garbage records of discharges of animal carcasses and other relevant information to inform and assist future reviews of MARPOL Annex V regulations and associated guidelines.

Mortalities in excess of those generated during the normal operation of a ship

2.12.12 Carcasses of animals resulting from mortalities in excess of those generated during the normal operation of a ship are not "garbage" under MARPOL Annex V and are not covered

under these Guidelines. To assist in managing these situations, masters should contact the flag State of the ship and, where appropriate, port and/or coastal State(s), to seek guidance on the appropriate legal regimes and requirements, as well as consult relevant IMO guidelines and circulars. In particular, masters should refer to the *Revised Guidance on the management of spoiled cargoes* (MEPC.1/Circ.809), developed by a Joint London Convention and Protocol/MEPC Correspondence Group.

2.12.13 "Mortalities in excess of those generated during the normal operation of a ship" refers to animal mortalities in excess of those described in paragraph 2.12.2. While this could be a number of animals dying at the same time or within a short period of time, the number of mortalities that exceed those generated during the normal operation of a ship will depend upon the animal species and the total number and/or species carried in the consignment.

2.12.14 Circumstances that may result in mortalities that exceed those generated during the normal operation of the ship, include:

- .1 malfunctioning of ventilation or watering systems;
- .2 weather events such as heat waves or storm systems;
- .3 infectious disease outbreaks; and
- .4 refusal of cargo offloading by authorities at destination, leading to the need to euthanize some or all of the live animal cargo.

2.12.15 The guidance provided above and the *Revised Guidance on the management of spoiled cargoes* are not substitutes for any stricter requirements imposed upon a ship by a port State, a flag State or the exporting country, for the management of livestock cargoes.

2.13 Discharge of fish carried as a cargo

Fish, including shellfish, carried on board as cargo that have died or been euthanized on board during the voyage are considered to be animal carcasses and should, to the extent practicable, be treated in the manner set out in section 2.12 of these Guidelines. Governments may want to consider additional actions to reduce the risk of spreading parasitic or pathogenic organisms.

3 MANAGEMENT OF CARGO RESIDUES OF SOLID BULK CARGOES

3.1 Cargo residues are included in the definition of garbage within the meaning of regulation 1.9 of MARPOL Annex V and may be discharged in accordance with regulations 4.1.3 and 6.1.2 and paragraph 5.2.1.5 of part II-A of the Polar Code. However, cargo material contained in the cargo hold bilge water should not be treated as cargo residues if the cargo material is not harmful to the marine environment and the bilge water is discharged from a loaded hold through the ship's fixed piping bilge drainage system.

3.2 Cargo residues are considered harmful to the marine environment and subject to regulations 4.1.3 and 6.1.2.1 of MARPOL Annex V if they are residues of solid bulk cargoes (other than grain) which are classified according to the criteria set out in appendix I of the Annex.

3.3 Cargo residues that are harmful to the marine environment may require special handling not normally provided by reception facilities. Ports and terminals receiving such cargoes should have adequate reception facilities for all relevant residues, including when contained in washwater.

3.4 Solid bulk cargoes, as defined in regulation VI/1-1.2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, other than grain, shall be classified in accordance with appendix I of MARPOL Annex V, and declared by the shipper as to whether or not they are harmful to the marine environment. For ships engaged on international voyages, such a declaration should be included in the information required in section 4.2.3 of the IMSBC Code. For ships not engaged on international voyages, other means of declaration may be used, as determined by the Administration.

3.5 Ports, terminals and ship operators should consider cargo loading, unloading and onboard handling practices⁸ in order to minimize production of cargo residues. Cargo residues are created through inefficiencies in loading, unloading, onboard handling. Options that should be considered to decrease the amount of such garbage include the following:

- .1 ensuring ships are suitable to carry the intended cargo and also suitable for unloading the same cargo using conventional unloading methods;
- .2 unloading cargo as efficiently as possible, utilizing all appropriate safety precautions to prevent injury or ship and equipment damage and to avoid or minimize cargo residues; and
- .3 minimizing spillage of the cargo during transfer operations by carefully controlling cargo transfer operations, both on board and from dockside. This should include effective measures to enable immediate communications between relevant ship and shore-based personnel during the transfer operations and when feasible, enclosure of conveyance devices such as conveyor belts. Since this spillage typically occurs in port, it should be completely cleaned up immediately following the loading and unloading event and handled as cargo; delivering it into the intended cargo space or into the appropriate unloading holding area.

3.6 When the master, based on the information received from the relevant port authorities, determines that there are no adequate reception facilities⁹ at either the port of departure or the port of destination in the case where both ports are situated within the same special area or Arctic waters, the condition under regulation 6.1.2.5 of MARPOL Annex V or paragraph 5.2.1.5 of part II-A of the Polar Code should be considered satisfied.

3.7 MARPOL Annex V, regulation 6.1.2, also applies when the "port of departure" and the "next port of destination" are the same port. To discharge cargo hold washwater in this situation, the ship must be en route and the discharge must take place not less than 12 nm from the nearest land.

4 TRAINING, EDUCATION AND INFORMATION

4.1 These Guidelines are intended to address Governments, shipowners, ship operators, ships' crews, cargo owners, port reception facility operators and equipment manufacturers as sources of pollution of the sea by garbage. Accordingly, Governments should develop and undertake training, education and public information programmes suited for all seafaring communities under their jurisdiction, prepared and presented in such a way that they communicate with that segment of the community.

⁸ Refer to the International Maritime Solid Bulk Cargoes Code (IMSBC Code).

⁹ Refer to the *Consolidated Guidance for port reception facility providers and users* (MEPC.1/Circ.834).

4.2 Governments may exchange and maintain information relevant to compliance, non-compliance and information on legal proceedings for violations with Annex V regulations through the Organization. Governments are encouraged to provide the Organization with the following:

- .1 technical information on shipboard garbage management methods such as minimization, recovery, recycling, reuse, incineration, compaction, separation, sorting and sanitation system, packaging and provisioning methods;
- .2 educational materials developed to raise the level of compliance with Annex V. This includes printed materials (e.g. placards, posters, brochures, etc.), photographs, DVDs, audio and video tapes, and films as well as synopses of training programmes, seminars and formal curricula; and
- .3 information and reports on the nature and extent of garbage from shipping found along beaches and in coastal waters under their respective jurisdictions. In order to assess the effectiveness of Annex V, these studies should provide details on amounts, distribution, sources and impacts of garbage from shipping.

4.3 Governments are encouraged to amend their maritime certification examinations and requirements, as appropriate, to include a knowledge of duties imposed by national and international law regarding the control of pollution of the sea by garbage.

4.4 Placards required by regulation 10.1 of MARPOL Annex V should contain a summary declaration stating the prohibition and restrictions for discharging garbage from ships under the Annex and the possible penalties for failure to comply. Governments are encouraged to develop appropriate placards for use by every ship on their registry of more than 12 m in length overall and fixed and floating platforms (sample placards targeting crew and shipboard operations; fixed or floating platforms and ships operating within 500 m of such platforms; and passengers are shown in figures 1, 2 and 3.).

4.4.1 The declaration should be placed on a placard at least 12.5 cm by 20 cm, made of durable material and fixed in conspicuous and prominent places on board the ship. Placards should be replaced when damage or wear compromises the readability of the declaration.

4.4.2 The placards should be placed in prominent places where crew will be working and living and in areas where bins are placed for collection of garbage. These places include galley spaces, mess room(s), wardroom, bridge, main deck and other areas of the ship, as appropriate. The placards should be displayed at line of sight height and be printed in the working language of the crew. Ships which operate internationally will also have placards printed in English, French or Spanish, in accordance with regulation 10.1.2 of MARPOL Annex V.

4.4.3 Where the ship carries passengers, placards also should be placed in prominent places where passengers are accommodated and congregate. These include cabins and all deck areas for recreational purposes open to passengers.

4.5 Governments should ensure that appropriate education and training in respect of MARPOL is included in the training programmes leading to STCW and STCW-F certification.

4.6 Governments are encouraged to have maritime colleges and technical institutes under their jurisdiction develop or augment curricula to include both the legal duties as well as the technical options available to professional seafarers for handling ship-generated garbage. These

curricula should also include information on environmental and ecological impacts of garbage. A list of suggested topics to be included in the curriculum is provided below:

- .1 garbage in the marine environment, sources, methods for prevention of release of garbage to the environment and impacts on the environment;
- .2 national and international laws relating to, or impinging upon shipboard waste management;
- .3 health and sanitation considerations related to the storage, handling and transfer of ship-generated garbage;
- .4 current technology for onboard and shoreside¹⁰ processing of ship generated garbage; and
- .5 provisioning options, materials and procedures to minimize the generation of garbage aboard ships.

4.7 Professional associations and societies of ship officers, engineers, naval architects, shipowners, managers and seafarers are encouraged to ensure their members' competency regarding the handling of ship-generated garbage.

4.8 Ship and reception facility operators should establish detailed training programmes for personnel operating and maintaining ships' garbage reception or processing equipment. It is suggested that the programme include instruction on what constitutes garbage and the applicable regulations for handling and disposing of it. Such training should be reviewed annually and updated as appropriate.

4.9 Generalized public information programmes are needed to provide information to non-professional seafarers and others concerned with the health and stability of the marine environment, regarding the impacts of garbage at sea. Governments and involved commercial organizations are encouraged to utilize the Organization's library and to exchange resources and materials, as appropriate, to initiate internal and external public awareness programmes.

4.9.1 Methods for delivering this information include radio and television, articles in periodicals and trade journals, voluntary public projects such as beach clean-up days and adopt-a-beach programmes, public statements by high government officials, posters, brochures, social media, conferences and symposia, cooperative research and development, voluntary product labelling and teaching materials for public schools.

4.9.2 Audiences include recreational sailors and fishermen, port and terminal operators, coastal communities, ship supply industries, shipbuilders, garbage management industries, plastic manufacturers and fabricators, trade associations, educators and Governments.

4.9.3 The subjects addressed in these programmes are recommended to include the relevant domestic and international law; options for handling garbage at sea and upon return to shore; known sources and types of garbage; impacts of plastics on marine life and ship operations; the accumulation of garbage in the world's oceans and seas, impacts on coastal tourist trade; current actions by Governments, intergovernmental organizations, non-governmental organizations and sources of further information.

¹⁰ Reference may also be made to other technical guidance such as, ISO/CD16304 Ships and marine technology – Marine environment protection – Arrangement and management of port waste reception facilities.

5 PORT RECEPTION FACILITIES FOR GARBAGE

5.1 The methodology for determining the adequacy of a reception facility should be based on the number and type of ships that will call at the port, the waste management requirements of each type of ship as well as the size and location of a port. Emphasis should also be placed on calculating the quantities of garbage, including recyclable material, which is not discharged into the sea, in accordance with the provisions of MARPOL Annex V.

5.2 It should be noted that, due to differences in port reception procedures and additional treatment among ports, port reception facilities may require the separation on board of:

- .1 food wastes (e.g. animal derived products and by-products because of risk of animal diseases);
- .2 cooking oil (animal derived products and by-products because of risk of animal diseases);
- .3 plastics;
- .4 domestic waste, operational waste and recyclable or reusable material;
- .5 special items like medical waste, outdated pyrotechnics and fumigation remnants;
- .6 animal wastes, including used bedding from the transport of live animals (due to risk of disease) but excluding drainage from spaces containing living animals;
- .7 cargo residues; and
- .8 E-waste such as electronic cards, gadgets, equipment, computers, printer cartridges, etc.

5.3 Ship, port and terminal operators should consider the following when determining quantities and types of garbage on a per ship basis:

- .1 types of garbage normally generated;
- .2 ship type and design;
- .3 ship operating route;
- .4 number of persons on board;
- .5 duration of voyage;
- .6 time spent in areas where discharge into the sea is prohibited or restricted; and
- .7 time spent in port.

5.4 Governments, in assessing the adequacy of reception facilities, should also consider the technological challenges associated with the recycling, treatment and discharge of garbage received from ships and should take responsible actions within their national programmes to consider garbage management standards. In doing so, relevant international standards should be taken into account.

5.4.1 The type and capacity of equipment for treatment and final disposal of garbage is a significant factor in determining the adequacy of a reception facility. It not only provides a measure of the time required to complete the process, but it also is the primary means for ensuring that ultimate disposal of the garbage is environmentally sound.

5.4.2 Governments should continue to carry out studies into the provision of reception facilities at ports in their respective countries in close cooperation with port authorities and other local authorities responsible for garbage handling. Such studies should include information such as a port-by-port listing of available garbage reception facilities, the types of garbage they are equipped to handle, their capacities and any special procedures required to use them. Governments should submit data on the availability of port reception facilities to GISIS.

5.4.3 While selecting the most appropriate type of reception facility for a particular port, consideration should be given to several alternative methods available. In this regard, floating plants for collection of garbage, such as barges or self-propelled ships, might be considered more effective in a particular location than land-based facilities.

5.5 These Guidelines aim to stimulate Governments to develop modern waste reception facilities and continue to improve their garbage management processes. Information on developments in this area should be forwarded to the Organization.

5.6 Governments are encouraged to develop policies and practices that facilitate the reduction, use and recycling of ship-generated garbage. The development of port reception facilities and associated guidance that aids the handling of separated garbage from ships should encourage ships to separate garbage on board.

5.7 Small Island Developing States may satisfy the requirements for reception facilities through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements.¹¹

6 ENHANCEMENT OF COMPLIANCE WITH MARPOL ANNEX V

6.1 Recognizing that direct enforcement of MARPOL Annex V regulations, particularly at sea, is difficult to accomplish, Governments are encouraged to consider not only restrictive and punitive measures consistent with international law, but also the removal of any disincentives, the creation of positive incentives and initiatives to facilitate more effective compliance, and the development of voluntary measures within the regulated community when developing programmes and domestic legislation to ensure compliance with the Annex.

6.2 Compliance facilitation and enforcement

6.2.1 Ships should inform their flag State of ports in foreign countries Party to MARPOL Annex V which do not have adequate port reception facilities for garbage. This can provide a basis for advising responsible Governments of possible problems and calling the Organization's attention to possible issues of compliance. An acceptable reporting format is reproduced in the *Consolidated Guidance for port reception facility providers and users* (MEPC.1/Circ.834), along with the procedure for submitting and handling such reports.

6.2.2 Governments should develop a strategy to assess or audit port reception facilities under their jurisdiction. Detailed guidance in this regard is provided by the Organization. At a

¹¹ Refer to the *2012 Guidelines for the development of a regional reception facilities plan* (resolution MEPC.221(63)).

minimum, periodic inspection of the reception facilities is recommended and consideration should be given to establishing a documentation system (e.g. letters or certificates) stating that adequate facilities are available for receiving ship-generated garbage.

6.2.2.1 Governments are encouraged to improve the adequacy and efficiency of existing port reception facilities for fishing gear.

6.2.3 Governments should identify appropriate agencies for enforcement and facilitating compliance and provide legal authority, adequate training, funding and equipment to incorporate the goals and objectives under MARPOL Annex V regulations into their responsibilities. In those cases where customs or agricultural officials are responsible for receiving and inspecting garbage, Governments should ensure that the inspections are facilitated.

6.2.4 Governments should consider the use of garbage management reporting systems. Such reporting systems may provide valuable data for measuring and monitoring the impacts of garbage regulations and management and identifying trends over time. A reporting system could be based on the information in garbage record books (where applicable) or ship's official log-book. In addition, advance notification forms and garbage reception receipts could provide input into the garbage reporting system.

6.2.5 A garbage management reporting system may also include reporting of discharges of garbage. Particular attention should be given to the reporting of any discharge in special areas or Arctic waters; discharge at port reception facilities; and discharge of garbage into the sea. Reports should include the date, time, location by latitude and longitude or name of port, type of garbage and estimated amount of garbage discharged. Particular attention should be given to the reporting of:

- .1 the loss of fishing gear;
- .2 the discharge of cargo residues;
- .3 any discharge in special areas or Arctic waters ;
- .4 discharge at port reception facilities; and
- .5 discharge of garbage into the sea, in those limited situations where permitted.

6.2.6 The issuance of documents or receipts (i.e. IMO standard forms) by port reception facilities might also be used in maintaining a garbage management reporting system.

6.3 Compliance incentive systems

6.3.1 The augmentation of port reception facilities to serve ship traffic without undue delay or inconvenience may call for capital investment from port and terminal operators as well as the garbage management companies serving those ports. Governments are encouraged to evaluate means within their authority to lessen this impact, thereby helping to ensure that garbage delivered to port is actually received and disposed of properly at reasonable cost or without charging special fees to individual ships. Such means could include, but are not limited to:

- .1 tax incentives;

- .2 loan guarantees;
- .3 public ship business preference;
- .4 special funds to assist in problem situations such as remote ports with no land-based garbage management system in which to deliver ships' garbage;
- .5 Government subsidies; and
- .6 special funds to help defray the cost of a bounty programme for lost, abandoned or discarded fishing gear or other persistent garbage. The programme would make appropriate payments to persons who retrieve such fishing gear, or other persistent garbage other than their own, from marine waters under the jurisdiction of Government.

6.3.2 The minimization of taking packaging on board and the installation of shipboard garbage management handling and processing equipment would facilitate compliance with MARPOL Annex V and lessen the burden on port reception facilities to process garbage for discharge. Therefore, Governments might consider actions to encourage the reduction of packaging and the installation of certain types of garbage processing equipment on ships operating under their flag. For example, programmes to lessen costs to shipowners for purchasing and installing such equipment, or requirements for installing compactors, incinerators and comminuters during construction of new ships could be very helpful.

6.3.3 Governments are encouraged to consider the economic impacts of domestic regulations intended to ensure compliance with MARPOL Annex V. Due to the highly variable nature of ship operations and configurations, consideration should be given in domestic regulations to permitting ships the greatest range of options for complying with the Annex. However, any range of options needs to be consistent with the Annex and should facilitate implementation and compliance.

6.3.4 Governments are encouraged to support research and development of technology that facilitates compliance of ships and ports with MARPOL Annex V regulations. This research should concentrate on:

- .1 minimization of packaging;
- .2 shipboard garbage handling systems;
- .3 ship provision innovations to minimize garbage generation;
- .4 loading, unloading and cleaning technologies to minimize dunnage, spillage and cargo residues;
- .5 new ship construction design to facilitate garbage management and transfer and to minimize retention of cargo in ship holds; and
- .6 wharf and berth design to facilitate garbage management and transfer.

6.3.5 Governments are encouraged to work within the Organization to develop port reception systems that simplify the transfer of garbage for ships engaged on international voyages.

6.4 Voluntary measures

6.4.1 Governments are encouraged to assist ship operators and seafarers' organizations in developing resolutions, by-laws and other internal mechanisms that encourage compliance with MARPOL Annex V regulations. Such groups include:

- .1 seamen and officer unions;
- .2 associations of shipowners, insurers and classification societies;
- .3 pilot associations; and
- .4 fishermen's organizations.

6.4.2 Governments are encouraged to assist and support, where possible, the development of mechanisms to promote compliance with MARPOL Annex V among port authorities, terminal operators, stevedores, longshoremen and land-based garbage management authorities.

APPENDIX

SAMPLE PLACARDS

Sample placard targeting crew and shipboard operations

Discharge of all garbage into the sea is prohibited except provided otherwise

The MARPOL Convention and domestic law prohibit the discharge of most garbage from ships. Only the following garbage types are allowed to be discharged and under the specified conditions.

Outside special areas designated under MARPOL Annex V and Arctic waters:

- Comminuted or ground food wastes (capable of passing through a screen with openings no larger than 25 mm) may be discharged not less than 3 nm from the nearest land.
- Other food wastes may be discharged not less than 12 nm from the nearest land.
- Cargo residues classified as not harmful to the marine environment may be discharged not less than 12 nm from the nearest land.
- Cleaning agents or additives in cargo hold, deck and external surfaces washing water may be discharged only if they are not harmful to the marine environment.
- With the exception of discharging cleaning agents or additives that are not harmful to the marine environment and are contained in washing water, the ship must be en route and as far as practicable from the nearest land.

Within special areas designated under MARPOL Annex V and Arctic waters

- More stringent discharge requirements apply for the discharges of food wastes and cargo residues; AND
- Consult MARPOL Annex V, chapter 5 of part II-A of the Polar Code and the shipboard garbage management plan for details.

For all areas of the sea, ships carrying specialized cargoes such as live animals or solid bulk cargoes should consult Annex V and the associated Guidelines for the implementation of Annex V.

Discharge of any type of garbage must be entered in the Garbage Record Book
Violation of these requirements may result in penalties.

Sample placard targeting fixed or floating platforms and ships operating within 500 m of such platforms

Discharge of all garbage into the sea is prohibited except provided otherwise

The MARPOL Convention and domestic law prohibit the discharge of all garbage into the sea from fixed or floating platforms and from all other ships when alongside or within 500 metres of such platforms.

Exception: Comminuted or ground food wastes may be discharge from fixed or floating platforms located more than 12 miles from the nearest land and from all other ships when alongside or within 500 metres of such platforms. Comminuted or ground food wastes must be capable of passing through a screen no larger than 25 millimetres.

Discharge of any type of garbage must be entered in the Garbage Record Book
Violation of these requirements may result in penalties.

Sample placard targeting passengers

Discharge of all garbage into the sea is prohibited except provided otherwise

The MARPOL Convention and domestic law generally prohibit the discharge of most forms of garbage from ships into the sea.

Violation of these requirements may result in penalties.

All garbage is to be retained on board and placed in the bins provided.
